THE IRON TRADE REVIEW

VOLUME XXVII. CLEVELAND, O. NOVEMBER 8, 1894. CHICAGO, ILL. NUMBER 45

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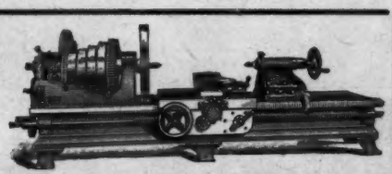

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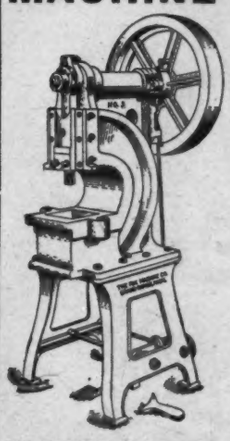

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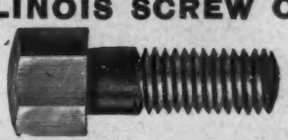

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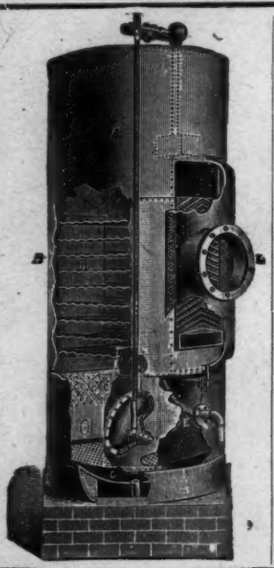

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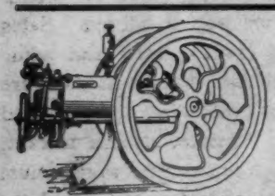

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THE IRON TRADE REVIEW

VOLUME XXVII. CLEVELAND, O. NOVEMBER 8, 1894. CHICAGO, ILL. NUMBER 45.

THE WEEK IN IRON CIRCLES.

GENERAL FEATURES.

If all the postponed buying of the past few weeks should materialize now that the election is over, for which buyers were waiting, there is a good week's business ahead in iron and steel. With few exceptions, iron and steel manufacturers are protectionists, and now that the country is practically beyond the possibility of further advances toward free trade for two or three years at least, it is to be expected that the business policy of individual buyers will be governed by their judgment as to the improved outlook. Sentimental improvement is already present; the next development to be expected is an improved demand and freer trading. The week under review has been uneventful in every selling center. For three weeks there has been a dwindling in the volume of business and salesmen have heard much of the desire of their customers to wait for election. Some furnacemen, indeed, have been holding off, for the same reason, preferring to take their chances on a more spirited market after a protection victory, rather than push sales on the weak market that has been experienced of late. Chicago notes a fair volume of sales the past week in Northern and Southern pig iron, due to the gradual inching of the foundry business toward a better basis. Pittsburg has done little in any sort of material. Bessemer and gray forge are weaker in that market, and there are signs of stock accumulations, but producers look for an early buying movement that will take up the slack. The Bessemer market is in such a position that one good-sized rail contract would in all probability result in a marked advance and furnacemen, not less than steel companies, are watching the railroad situation with keenest interest. Billets have also been weaker at Pittsburg and sales from outside mills continue to be made below the $15.75 of most local mills. The coke question is in its former state. Reports of threatened strikes count for little. Present probabilities are that the advance in price, if any comes with Jan. 1, will not be sufficient to call for higher wages under the scale. The tin plate struggle continues. The mills that were expected to take the initiative in starting as open mills have not yet taken on non-union men. A more serious effort will probably be made by both sides to arrive at a compromise.

THE CLEVELAND OUTLOOK.

The statistics of iron ore shipments are attracting more attention as the navigation season draws to a close. Lake Superior ports, as the St. Mary Falls canal figures show, sent down 5,456,382 gross tons up to Nov. 1. Escanaba and Gladstone shipments to the same date were 1,495,000 tons, making a total of 6,951,382 tons, or within 50,000 tons of a round seven millions. It is not probable that this last figure will be greatly exceeded by November businesss. From the head of the lake 95c and $1 have been the figure on a limited amount of tonnage the past week. This advance means a pinching off of shipments. Cases are known in which more ore would have come down but for the higher rate that has prevailed in the past three weeks. There is a call for boats to take ore to South Chicago, but at $1.05 and $1.10, which vessels ask, since there is nothing to be brought down from Chicago, contracting will be light. Boats are to be had at 50 cents from Escanaba and some ore is yet to be moved from that port.

Pig Iron. Weakness is evident in all grades of pig iron, but on the question whether it is only a passing condition there are varying opinions. In the valleys and in Pittsburg the heavy output of the past two months keeps up steadily and some furnaces selling in the open market have accumulated a little iron. Contracts of others have a month or so to run. In the past week an offer of $10 at valley furnace for Bessemer iron was declined by the furnace, and the feeling of Bessemer producers generally is averse to tying up to such a basis. The capacity of producers in the low-cost area has been employed steadily now for more than two months without any sensible accumulation and it is felt that the added demand after January 1 from new converting capacity will have a strengthening effect on prices. At present very llttle Bessemer iron is offered. Sales of foundry have brought out lower prices, and while some sellers still stick to $10@$11 at furnace, there are transactions in which $10.50 at furnace has been touched on No. 1. Southern irons are weaker in this market, and while $7 at furnace has been represented as minimum on No. 2 soft, this iron has been offered in Cleveland the past week at $9.75, delivered. It can be seen that either the $3.45 freight is being cut deeply, or the price of the iron is shaded considerably—probably there are concess ions on both. Gray forge is weak, and while there is little selling in the Valley, Pittsburg sales have been made on a basis carrying the valley furnace price below $9.

Finished Material. There is said to be considerable work in abeyance that will soon be felt in the market, but actual business has been scarce of late. Some weakening in prices is noted and 1.25c, Pittsburg, on beams and channels, equivalent to 1.34c Cleveland, has been shaded. Some bar iron sales have been made—one of 500 tons—at the low figures heretofore noted.

THE CHICAGO OUTLOOK.

[SPECIALLY REPORTED FOR THE IRON TRADE REVIEW.]

Business has been rather quiet in all branches of the iron trade in the past week, and there have been no new developments of any character. Sales were about the same as those of last week, both in number and size. It is not probable that trade will be much better in the present week, and there may be somewhat of a falling off in orders, as the election of Tuesday has interrupted business to a certain extent.

PIG IRON.—Sales of local iron were fairly large last week, and at least two orders for 500 tons were closed, with several ranging from 200 to 300 tons and a good carload business. The aggregate for the week was fully as large as that of the week before. Prices are unchanged and are quite firm. Southern iron has kept up to the pace set last week, several good sized sales having been made —one of 500 tons and others of 200 to 300 tons. Inquiry for both Northern and Southern iron keeps up well, and is quite large. Lake Superior charcoal iron is quiet, and only a few small sales were made last week. Foundries appear, upon the whole, to be doing rather better, but the improvement is slow and comes by fits and starts rather than steadily. Agricultural implement men are all busy making up stock for next year, and some of them, those manufacturing smaller implements, as well as the makers of windmills and well tools, are working overtime. Stove men are doing little, and are complaining of dull trade. Foundries manufacturing architectural iron are suffering from slow business, not so much because there is no building as because steel is supplanting iron to a greater extent all the time. Jobbing founders are doing well and ill intermittently, one being busy one week, while the next week his neighbor gets the business. Machinery castings are in rather better demand, and founders making them are running more regularly and with larger heats. Our quotations are now as follows:

Lake Sup Charcoal.....	$13 00@14 50	Southern No. 2 Soft.....	10 00@10 25
Local Coke Fdy. No. 1...	10 25@10 50	South'n Silveries No. 1.	$11 50@11 75
Local Coke Fdy. No. 2...	10 00@10 25	South'n Silveries No. 2.	11 25@11 50
Local Coke Fdy. No. 3...	9 50@10 00	Jackson Co. Silveries...	15 00@16 00
Local Scotch Fdy. No. 1.	10 75@11 00	Ohio Silveries No. 1.....	14 00@14 50
Local Scotch Fdy. No. 2.	10 00@10 50	Ohio Silveries No. 2.....	13 00@13 50
Local Scotch Fdy. No. 3.	9 50@10 00	Ohio Strong Softeners...	13 00@13 50
South'n Coke No. 1.....	11 00@11 25	Alabama Car Wheel.....	17 50@18 00
South'n Coke No. 2.....	10 25@10 50	Malleable Bessemer.....	10 50@11 25
South'n Coke No. 3.....	10 00@10 25	Coke Bessemer	11 25@11 50
Southern No. 1 Soft.....	10 25@10 50		

BARS.—Trade in the past week has been limited to small orders, and not very many of them. Prices are unchanged at 1c for common iron, guaranteed iron, 1.10c to 1.15c; steel bars, strictly billet stock, 1.20 to 1.25c.

STRUCTURAL MATERIAL.—Bids were opened last week for those bridges over the drainage canal, but so far contracts have not been let. A few orders for material for bridges were placed last week, but aside from this nothing was done. Prices are as last reported: Beams, 1.45c; plates, 1.45c; angles, 1.40c; tees, 1.65c. Small lots from stock are quoted at ¼c to ½c higher.

RAILS AND TRACK SUPPLIES.—There is no change in the situation. Present sales are small, but a good business is looked for at the end of this year or the first of next. A 6,000-ton sale, of 60-pound rails has been made to the Chicago, Paducah & Memphis. Prices are made: Rails, $25 to $27; splice bars, 1.25c to 1.30c; track bolts, 2c. to 2.10c; spikes, 1.75c. to 1.80c.

BILLETS AND RODS.—The market is quiet, with no sales of either billets or rods, which are quoted, nominally, respectively at $18 and $25.

PLATES.—There continues to be a fair demand, both for delivery from store and mill. Prices are made as follows for mill shipment: Tank steel, 1.40c to 1.50c; flange steel, 1.65c to 1.70c; firebox steel, 1.75c to 5c; boiler tubes, 75 per cent. discount.

MERCHANT STEEL.—A fair business has been done in some grades, notably those used by the agricultural implement manufacturers. Prices are as follows, on mill shipments: Open-hearth spring, tire and machinery steel, 1.75c to 1.80c; smooth finished machinery and tire, 1.50c. to 1.60c.; Bessemer bars 1.40c. to 1.45c.; tool steel, 5.50c to 7.50c.; specials, 11c.

SHEETS.—Black sheets are in fair demand and one or two good orders were placed in the past week. Prices are made at 2.35c. to 2.40c. for No. 27 common iron; steel sheets are quoted at 2.45c to 2.50c. Galvanized sheets are in only small demand, and prices are now made at 75 and 10 and 5 to 75 and 15 per cent. discount, on mill shipments.

OLD RAILS AND WHEELS.—Nothing has been done in the local market, but a sale was made of 1,500 tons of old wheels to go East, on a basis of $10, Chicago. A sale was also made of old iron rails for delivery East. They are quoted, nominally, at $11. Old steel rails are quiet and nominal at $7.50 for short to $10.50 for long lengths.

SCRAP.—The demand continues, and several good sales were made last week. Prices are made as follows: No. 1 forge, $8.50 to $9.00; No. 1 mill, $7; No. 1 machinery, $7.50; axles, $13.50; cast borings, $3.50; wrought turnings, $5.00; axle turnings, $6.50; mixed steel, $5.50; heavy cast, $7 to $7.50; stove plates, $5 to $5.25; heavy melting steel, $7 to $7.25.

IN OTHER MARKETS.

[SPECIALLY REPORTED FOR THE IRON TRADE REVIEW.]

Pittsburg. There has been little in the market this week on which to base either quotations or comment. The pendency of election plainly affected trading and since the receipt of returns there has been no room for business. A few buyers have covered for the balance of the year in the past ten days, but it is the policy of the majority of consumers to hold off for a little. Furnacemen have practically withdrawn from the market, little material being offered either for prompt or future shipment. If there has been any change in prices on crude iron it has been in the direction of weakening. Notwithstanding light stocks there are sellers who will not risk the loss of a sale. Concessions to secure orders for gray forge are reported and quotations now rule from $9.60 to $9.75. Bessemer ranges from $10.80 to $11 in the few transactions reported. In foundry iron, $11.50 @ $11.75 for No. 1 and $10.50 @ $10.75 for No. 2 is about the range. Steel billets are a trifle weaker, though there is little business at any price. Inquiries have been more frequent, however, and a buying movement is promised. It is the impression of buyers that lower prices will be seen, but Pittsburg sellers in general have had $15.75 as their minimum. It is said that the lower prices made for the product of Ohio river mills have been secured through brokers and that direct quotations from mills in the Wheeling district have not gone below $15.50 at maker's mill. In finished material new orders are not plentiful, though there are fair inquiries. In plates a firmer feeling is found in spots, quotations depending on the condition of order books. Sheets show a lessened demand. Sales of railroad material are gradually expanding in volume, but there is nothing yet bearing the significance of a general movement. The scrap market has less life, with prices stationary. Advices from the Uniontown section of the Connellsville region say that the workers are agi-

tating a strike Nov. 15, but this is denied by the leaders. The latter say, however, that the men expect an advance and will strike if they do not get it. The men have been led to believe that the market price of coke is high enough to warrant an advance under the Frick scale, but this is a mistake. Prompt sales of furnace coke are still made at 90c and $1.

Cincinnati. A few buyers have shown a disposition to get in ahead of a possible advance in prices, and have been negotiating for iron for deliveries running well into next year. The majority of consumers, however, while anxious to see an improvement, have no disposition to speculate upon it. Most melters would gladly pay an advance for raw material, knowing that it would mean better prices and larger profits for them. There has been quite a feeling among the furnaces in favor of holding off for a little time, because of the prospect of improvement after the election. On this account, there has been no disposition to push sales the past week. This feeling is more pronounced in the South than in the North. Some Northern furnacemen profess to see little or no prospect for improvement ahead, until wheat and cotton bring better prices, and the earnings and spending capacity of the people is brought up to some extent. A factor of some importance in the South is a scarcity of competent furnace labor, and the difficulty of supplying ore for the largely increased output of the furnaces in blast. Another cause of annoyance and reduced shipments is the growing scarcity of cars for loading iron.

Buffalo. There is more or less new business doing and while below the average volume it seems sufficient, along with prior contracts, to keep pig iron producers busy and the Northern furnace interests tributary to this market closely sold up. On the other hand offerings from the Southern furnaces are abundant and while the high freights make the cost here a trifle higher than Northern competition, the difference is not sufficient to interfere greatly with the use of those irons in foundry mixtures. Were it not for the low basis of prices, the furnace interests would have occasion to be satisfied with present conditions, as no stocks worth mentioning have accumulated, while in some instances difficulty is experienced in keeping up with orders. Prices remain unchanged.

St. Louis. Considerable interest has been shown by both large and small consumers of pig iron. Numerous orders for lots of 50 to 200 tons have been placed and the demand is well distributed for Southern and Northern brands. Prices are stationary and are certainly low enough to satisfy the most bearish buyer.

Railroad Mileage in England and America.

At the end of 1892 there were 20,325 miles of railroad open for traffic in the United Kingdom. In England and Wales alone, where the railroads are the thickest, there were 14,242 miles. In the United States there were about 172,000 miles of completed railroad at the end of the same year, and statistics of working were reported for a little less than 171,000. Actually, then, we have nearly nine times as many miles of railroad as the United Kingdom. But we are nearly 25 times as big (leaving out Alaska), and proportionately to area the United Kingdom has three times as much railroad as we have. Proportionately to population, however, our supply is greater; each inhabitant here has five times as much railroad as an Englishman has.

AN addition is to be built to the rail mill of the Edgar Thomson Steel Works at Braddock, Pa. The mill will begin shortly on an order for 100-pound rails for the Pennsylvania Railroad.

RECEIVED FROM THE TRADE.

The 1895 catalogue of the Lunkenheimer Co. is probably the first to bear the imprint of the year soon to open. It is a clearly printed and illustrated volume of 107 pages and its cuts and descriptive matter are well arranged to inform the reader clearly as to the value of the Lunkenheimer brass and iron valves, lubricators and other steam specialties. A number of these have been illustrated and described at various times in these columns. Copies of the catalogue can be had on application to the Lunkenheimer Co., Cincinnati.

"Coal Handling in Power Stations," is a 50-page pamphlet issued by the C. W. Hunt Co., 45 Broadway, New York. It is full of engravings showing how the Hunt system of coal conveying is adapted to supplying the boilers of large plants.

The Thurman Fuel Oil Burner Co.'s system of burning crude petroleum as a substitute for coal, coke or wood, for boilers, furnaces, forges, ovens, kilns, etc., is described with some detail of illustration in a new catalogue just sent out from the company's main offices at Indianapolis. The use of oil as fuel under boilers, in heating and annealing furnaces and in other situations in the production of finished iron and steel, is steadily increasing, and the Thurman equipment has been finding favor with many producers. The catalogue contains testimonials from two important Central Western concerns, one using the system on annealing furnaces and on light forges and the other in connection with steel furnaces in a steel casting plant.

Cutters are the theme of a handsomely illustrated standard-size catalogue of the Browne & Sharpe Mfg. Co., Providence, R. I. This company now manufactures 19 varieties and 849 sizes of stock cutters. Views of special cutters are given, illustrative of the company's facilities for this class of work.

The Bellaire Stove Co., of Bellaire, O., has put out catalogue No. 3 giving cuts and descriptions of the Star stoves and ranges they are selling for 1894-5. There are 71 pages of cuts and details with list of the various forms of hollow-ware and other specialties manufactured.

The Lodge & Davis Machine Tool Co., of Cincinnati, O., has just issued a handsome circular, illustrating its line of universal and p'ain milling machines. It will be sent upon application.

The Manufacturers' Tool Supply Co., 17 South Canal st., Chicago, has recently gotten out a new card which is unique and attractive. It is an ordinary business card on the face, but upon the back is a long list of the goods in which the company deals and for which it is agent, arranged in the form of an acrostic upon the name of the company.

O. J. Edwards, of Philadelphia, has issued under copyright accurate tables of diameters, areas, weights, etc., of cold drawn seamless tubing. The tables include internal diameters, areas external and internal, area of cross-section of metal, weight in pounds per foot, weight in pounds per inch. The left hand column of each set of tables is the gauge of the metal, expressed in numbers (from 3 to 28) and in decimals of an inch (from .259 to .014). The external diameters are given in the top column across the page, ranging from ¼" to 2¼". The compilation is a serviceable one and will save many tedious computations by users of drawn tubes. Mr. Edward's address is 411 Heed Bldg., Philadelphia.

AT Youngstown, O., on Saturday, Nov. 3, a meeting of the National Association of Iron and Steel workers, commonly known as the Finishers' Union, installed officers for the coming year as follows: George W. Lamoree, of New Castle, president; Chas. Phillips, vice president; P. J. Mundie, secretary, and M. H. Logue, treasurer, all of Youngstown. In his address, President Lamoree referred to the success of the organization in getting a strong footing in Ohio, Pennsylvania and Indiana, and predicted that with proper effort all finishing mills would be represented in the union.

MONDAY, Nov. 5, was the time set by the United States Iron & Tin Plate Co., of Demmler, Pa., and Wallace, Banfield & Co., of Irondale, O., for a resumption of work at a reduced rate of wages, in their tin plate mills, but the start was not made. None of the old hands at either mill applied for their positions, and new men have not been secured.

THE IRON TRADE REVIEW

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ENTERED AT THE POST OFFICE IN CLEVELAND, O., AS SECOND CLASS MATTER.

NOVEMBER 8, 1894.

THE ELECTIONS AND BUSINESS.

The interest of *The Iron Trade Review* in the election result of Tuesday begins and ends with its relation to the prosperity of the country's industries. The partisan aspects of the verdict that has just been given are of no concern to us. But as an earnest of the people's determination to do all that can be done by the ballot to restore the prosperity of other days, we regard it as the most tremendously significant expression in a generation. To our friends across the sea who have had an absorbing interest in the industrial phases of American politics, it may appear that the chief characteristic of the American voting body is fickleness. That the National election of 1892 meant that the people of the United States wanted a change from protection to free trade, has been repeatedly asserted; yet there were other elements in that contest—the bitterness engendered by an inflammatory press, out of the labor disputes of the year; the religious prejudice injected into the elections in Illinois and Wisconsin, and in general a socialistic upheaval due to discontent and the industrious spreading of the populist leaven.

But whatever the reasons that led the people in 1892 to barter the birthright of American capital and labor, there is no mistaking the significance of the utterance just made. In bringing the country to a sense of the danger confronting it, a combination of unforeseen conditions has operated in the past 18 months with an effectiveness beyond the hopes of protection's most sanguine friends. It was said two years ago that the free trade victory meant that the protective system would be gradually eliminated from the fiscal policy of the country. A tariff reform ways and means committee had gone to work on that basis and its intentions were known to the country before the state elections of 1893. The judgment registered at that time was hailed by the friends of protection as one likely to give the Wilson bill framers pause. It had no such effect. The weary struggle that ended in the passage of the Gorman law is familiar history. The new law was fairly before the people for approval or disapproval, and they have said by an uprising, unequaled in a generation, that they want none of it. The people want prosperity back again. They have been convinced by bitter experience that a tariff to increase imports will not keep American shops busy. They have reasoned that if idleness for tens of thousands and reduced wages for those who work result from the threat of tariff reform, the shorter the life of a law embodying that policy the better.

As to the immediate effect of the elections of Tuesday on industry: There are still three months of the 53d Congress. A tariff reform majority in the House has the power to pass further bills looking toward free trade. It is scarcely supposable that in the face of the verdict just rendered any such attempts will be made; and should they be made there is a safe majority in the Senate against free iron ore and free coal or any other radical measure. The gratifying feature of the situation as it stands, is that it insures the country against tariff upturning for three years at least. A tariff reform President, a protectionist House and a doubtful Senate make as perfect a deadlock as could be furnished to order. The business world is to have rest from legislative harrowing and can lay its plans in peace. Bad as the Gorman law is in many features, there is satisfaction in knowing that it will not soon be changed.

In iron and steel there is no expectation of an advance in prices that can be felt. Wages, ore and fuel are at the bottom of the ladder. Producing capacity has many loose folds that must be caught up by the winds of trade before any pronounced change can come. But there is greater confidence in the business world than at any time in two years. Stability will gradually take the place of uncertainty. Capital will go into industries least affected by the new tariff and there will be a steady advance to better ground.

In a word, business and politics can part company for a time. Business has suffered much from the intimacy and is bound to be a great gainer in the separation.

THE movement for a series of expositions in Mexico and Central and South America, to assist in enlarging the market for machinery manufactured in the United States, is having good support in Cincinnati. The Lodge & Davis Machine Tool Co., the J. A. Fay & Egan Co., and other manufacturers there who have pioneered in the opening up of South American markets are urging action now for the removal of conditions that have limited commercial intercouse with these countries heretofore; and as a first step toward a better footing they advocate the restoration as soon as possible of the reciprocity arrangements rescinded by the 53d Congress. In a letter to a local paper, Mr. T. P. Egan says that very little foreign business can be done unless these treaties are restored. Speaking of the necessity now thrust npon our manufacturers for seeking this foreign trade he writes:

It is true that the rapid development of our own country has heretofore called for nearly the entire output of our manufacturing establishments, but the recent past, and in fact the present condition of the machinery trade, prove that our foundries and machine shops have a greater capacity than domestic consumption demands, and our manufacturers are on an active outlook for new trade fields. It has not been a lack of enterprise, but a lack of necessity, that has until now deterred their efforts to win the trade of our sister Republics.

It is useless now to comment on the changed home conditions that have emphasized the necessity of reaching out to take the trade in the Latin countries, that is now going largely to Europe. The condition exists and it is likely to continue for some time. Meantime concerted action by machinery manufacturers in this country can do much. The Manufacturers' Association of Cincinnati,

taking up the suggestion of *Dixie*, is at work trying to arrange for a convention in that city of manufacturers who desire to organize for a campaign of expositions, the first to be held in the City of Mexico. Such a move is bound to result in much good, and we trust there will be a hearty response by machine tool and other machinery manufacturers throughout the country.

PIG iron from the furnaces of Western New York is still sold freely in Montreal, and several lots of foundry iron have been placed there within a fortnight at about $17.50 delivered including a duty of $4. Sellers of Canadian iron and importers of Scotch irons had congratulated themselves that American pig iron would not be heard of so far east, after the tariff question had been settled; but all depends upon how long it takes for the home market of the furnaces on this side the border, to reach their old proportions.

Now let the country drop politics for a while and give its attention strictly to business.

THERE have been three plainly marked steps in the country's advance from the depths of financial and industrial depression: First, the enactment of the silver purchase repeal law; second, the defeat of the original Wilson bill; third, the election of a protection majority in the House of Representatives on Nov. 6, and the assurance thus given that further steps toward free trade will be impossible after March 4 next.

ALREADY the 7,000,000-ton mark has been passed by the Lake Superior ore shipments of the present season. Shippers have evidently been studying the Bessemer pig iron statistics of the past half year. Between four-fifths and nine-tenths of the ore brought down is of Bessemer grade.

IT is safe to say that stocks of confidence have been accumulating in the business world for two days, at least, and that the same rate kept up for a few months will be more than an offset to any accumulations of material that may occur meantime.

Our Welsh cousins are still laboring under a delusion about the status of tin plate manufacture in the United States. They have laid the unction to their souls that if they can deport the Welsh rollers of black plates now in the United States, they will have put an end to the tin plate industry on this side, just as they thought at an earlier day to kill it by stopping the export of black plates to be dipped in the United States. We were disposed, at the first publication of this plan to pay the passage of Welsh rollers back to Wales, to regard it as newspaper chaff. But there is evidence that it has had sober and deliberate consideration by the tin plate masters of Wales. We take it that these men who have tasted of the good things that go with the normal American wage basis, would not return to their old jobs on any terms that did not involve a large increase in their old wages. But supposing they could be induced to go back, it is a ridiculous assumption that tin plate making in the United States would not go on without them. The chief mistake of the Welsh manufacturers to whom this brilliant scheme is credited, is in assuming that any great number of Welshmen were brought over to do the rolling in black plate mills. Many of the workers holding these positions were already in the United States when the tin plate industry was established, working in other branches of iron and steel manufacture. Even if all should go, there are plenty of skilled workmen to take their places. The Amalgamated Association has an important stake in the maintenance of the tin plate industry and it goes without saying that it would raise up other rollers as fast as they were called for. The wages of black plate rollers are altogether too tempting to permit that occupation to lapse into desuetude on this side the water. The tin plate industry in the United States has come to stay and plans like those lately laid in Wales, are like attempting to bind a Samson with wisps of straw.

Personal.

Andrew Carnegie arrived in New York Nov. 3.

Chas. L. Colby, who is connected with important Gogebic range interests, has returned to New York from his European trip, greatly improved in health.

P. H. McEvey's term as assistant president of the Amalgamated Association expired last week. The office was abolished on his recommendation.

E. Windsor Richards, president of the Iron and Steel Institute and general manager of the Low Moor Iron Co., is now in the United States and a banquet is to be given him Nov. 8 at New York, by representatives of the iron and steel trades in this country. Mr. Richards on this occasion presents the Bessemer medal awarded last year to Mr. John Fritz, by the Iron and Steel Institute.

Thos. Rotthoff, general manager of the blast furnaces of the Carrie Furnace Co., at Rankin, Pa., has resigned his position te superintend the erection of the new blast furnaces the Carnegie Steel Co. will build at Duquesne.

General Manager James Gayley, Assistant General Manager Thomas James and Supt. Geo. F. Harris of the Edgar Thom- Steel Works, have been in the East inspecting prominent iron and steel plants. Important additions to the Edgar Thomson Works are contemplated.

Ambrose Beard, Sr., recently of Swansea, Wales, uncle of Ambrose Beard, Jr., of Cambridge, O., has been appointed superintendent of Irondale Steel & Iron Co.'s tin mills at Middletown, Ind.

The Connellsville Coke Situation.

There are few indications yet as to the price that will be made by the Connellsville coke operators after Jan. 1. The chances of a strike, in case the present wage basis is continued are small. If the operators get a higher price, or one high enough to ensure an advance in wages under the Frick scale, there will doubtless be an advance to the men at most plants. In the week ending Oct. 27 a greater output was made. The estimated production of 14,354 active ovens was 141,826 tons, an increase over the previous week of 2,816 tons. In the active list of ovens the net gain was 31. Shipments were 7,482 cars or 266 cars less than in the preceding week. To Pittsburg and river tipples, 2,264 cars were sent; to points west of Pittsburg, 3,811 cars; to points east of Connellsville, 1,407 cars. For the past six weeks, according to the *Courier*, shipments have averaged over 1,000 cars a day.

WAGES have been reduced 10 per cent. at the extensive brass works and iron foundry of the Henry McShane Mfg. Co., at Baltimore. The 600 men in the iron foundry will range from $8.10 a week to $21.60 under the reduction. Last spring the cut made in the fall of 1893 was restored and now, owing to strong competition, the firm returns to the reduced scale.

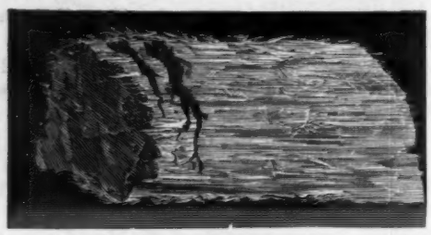
THE report that the mill owners in the Mahoning Valley have decided to make war on the Finishers' Union is denied by the former. They will have a conference with the finishers at an early date on certain portions of the scale but expect to arrange any differences amicably.

THE American Pig Iron Storage Warrant Co. had in yard Oct. 20, 1894, 102,500 tons of iron; in the following 11 days there were withdrawn 1,800 tons, leaving 100,700 tons in yard Nov. 1.

ASBESTOS IN POWER PLANTS.

Asbestos is a mineral as non-combustible as marble or granite and yet very different from these minerals, being fibrous in texture. A piece of crude asbestos is hard and solid like other minerals, but it can be crushed and torn until it becomes a soft silk-like mass of fibre. The mineral was originally found in Italy, and in 1876 was discovered in Canada, when a railway (Quebec Central Railway) was cut through the mountains south of the St. Lawrence river. Asbestos of a valuable kind was found. The fibre was different from that of the Italian—much stronger yet shorter. In the first year after the discovery, about 50 tons were mined, but it was impossible to sell it, owing to the limited demand. Since then the production of asbestos has run up to nearly 10,000 tons per year, and still there is not enough to meet all requirements.

Chrysolite, as metallurgists call the Canadian asbestos, is a crystallized serpentine rock. The Italian asbestos, which was originally altogether used by Louis Wertheim, is somewhat different, it being longer in fibre, sometimes two or three feet



CRUDE ASBESTOS.

long, and is not found in veins, but in pockets. While the fibre is longer, it is not so strong as the Canadian fibre, and for that reason does not spin as well. Since the Canadian asbestos has been found, the use of Italian asbestos has gradually diminished, and is now confined to chemical purposes and to specialties. Louis Wertheim now chiefly uses Canadian asbestos and the goods he sells are made from it.

Asbestos fibre differs materially from all fibres of animal or vegetable origin by having a perfectly smooth surface like spun glass, while cotton, hemp, wool, silk, etc., under the magnifying glass show tiny fibres or hairs grown on the main fibre. In manufacturing asbestos goods the fibres will not adhere to each other like other fibres; they will slip past each other, and it takes a peculiar process to accomplish the spinning of an asbestos thread, especially as the best grade of fibre averages less than one inch in length. Furthermore, asbestos fibre is only to a certain degree strong and durable, and if not carefully treated in the process of manufacturing it will be torn to pieces and its length reduced. Then again, asbestos in its natural state, after being mined, still contains a heavy percentage of serpentine rock, which often penetrates the asbestos veins and cannot be separated from it except through special machinery. In fibrising crude asbestos, this

ASBESTOS FIBRE.

hard rock is very liable to hurt and cut the tender fibre, and it is one of the most difficult mechanical processes to make a thorough separation without hurting the fibre.

How to do this and how to arrive at the most satisfactory results, is the difficult task of asbestos manufacturers. It has been the continual study of Louis Wertheim, of Frankfort-on-the-Main, Germany, one of the largest and best known manufacturers of asbestos goods, having made them for the past 30 years. He has recently established a sales agency for his goods in Chicago, at 207 Lake st., under the name of his son. The latter, Mr. Ed. Wertheim, has been connected with his father's business for 15 years, and is thoroughly acquainted with every detail of it. It was after having made an extensive exhibit at the World's Fair, of German asbestos goods, made by his father, that his American sales became so large as to make the establishment of an agency in this country necessary. He then opened a permanent office in Chicago.

In the manufacture of asbestos goods, Mr. Louis Wertheim has arrived at most satisfactory results. In his manufactures the length of the fibre is not reduced, and all of his goods are free of grit.

A piston packing must be made of material which will not injure the piston rod. Asbestos fibre, free of the bits of serpentine rock, is a soft fluffy material like silk or finest wool. It would not hurt the finest polished wood if rubbed against it with great force. The fact that in the past the piston rod has been sometimes injured by an asbestos piston packing, only proves that its manufacture was not well understood. Asbestos is not to blame for these faults, as pure asbestos fibre cannot hurt steel or iron.

Mr. Wertheim has had no complaints in this direction and his customers have never experienced any damage to the piston rod through his packings. The manufacturers state that German asbestos goods have given satisfaction and will do so wherever they are granted a fair trial.

Opening of the Whiteley Malleable Plant.

THE formal opening of the Whiteley Malleable Castings Co., at Muncie, Ind., Oct. 30, was attended by about 200 customers of the company and others from points in Indiana, Illinois and Ohio, Eastern cities being also represented. After an inspection of the great works the visitors were entertained at dinner served in the large carpenter shop, the young women employed in the core-room waiting upon the guests. Toasts were given and responded to, two hours being given up to the festivities. Mayor Geo. W. Cromer, of Muncie, made the address of welcome and Mayor James Johnson, Jr., of Springfield, O., responded. In the evening a reception was given the visitors at the Commercial Club. The Whiteley Malleable Castings Co. has a capital of $200,000. Its directors are: Burt H. Whiteley, president; George F. McCulloch, vice-president; Elmer J. Whiteley, secretary and treasurer; Thomas Liggett and John Whiteley. The works are probably the largest and most complete ever erected for the manufacture of malleable iron, gray iron and brass castings. The molding room, which is 571 feet long, has capacity for working 150 bench molders and fifty floor molders. The annealing department is 350 feet long and has 28,600 square feet of floor space. It has 16 double annealing ovens, capacity 25 tons, and is equipped with an electric traveling crane. The core department, pattern rooms, milling, pickling and assorting departments, shipping rooms, storage warehouse, power house, etc., are all on a large scale, the plant proper, with tracks and yards, taking up 12 acres of land. The supply of natural gas is received through a six-inch main, extending about three miles north of the factory site.

THE Gates Iron Works, which for 50 years have been located at the corner of Clinton and Washington Sts., Chicago, are now being removed to the old plant of the Chicago Iron Works, at Elston and Bloomingdale Aves., on the north branch of the Chicago river. This plant has been leased for 99 years at a rental of $1,800 a year, with the privilege of buying any time within three years, and has been completely remodeled for the use of the Gates Iron Works. This concern has also let the contract and ground has been broken for the erection of new and large machine shops on land adjoining the leased property, which is already held under a lease. When the plant is finished and running it will be one of the most complete and modern in the country, for the manufacture of mining machinery, which is the specialty of the Gates Iron Works.

THE Pennsylvania Railroad Co. has decided to increase its standard of weight of steel rails on the main line from 85 pounds to 100 pounds. The change is to go into effect next year and all new rails between Jersey City and Pittsburg will be of the new standard. The increase is principally due to the heavier locomotives, which the company has gradually been acquiring, besides the increase in speed. Most of the new rails will be 60 feet in length.

KELLEY VERTICAL WATER TUBE BOILER.

The improved boiler shown in the accompanying engravings consists of a central water column supported by water legs and provided with a horizontally disposed dry pipe or dome connected in suitable manner with the upper head of the central column. The column is provided with holes annularly arranged in the sides, and in these are expanded the inner ends of the water circulating tubes, the outer ends of which terminate in a coil arranged in step form. This arrangement of tube allows the water to rise as it becomes heated in its passage through the coil, and also compels the heated gases to impinge with great intensity upon every part of the coil.

A plan view of one section or one series of coils is shown in Fig. 2. The central column is supported by three water legs, the lower portion of column being tapered and the legs entering the latter at right angles to the tapered portion, this construction being advantageous to the strength of both column and water legs. The water legs are imbedded in the walls of the setting up to the point where they incline toward the columns. Each water leg is provided at its lower end with a "blow off" valve for the daily removal of sediment. It will be noticed that sediment accumulating in the water legs settles to a point below the level of the grates and to the coolest part of the boiler.

The upper end of the column is provided with a removable head having suitable bosses thereon for pipe connections between the top of the column and the steam dome. The

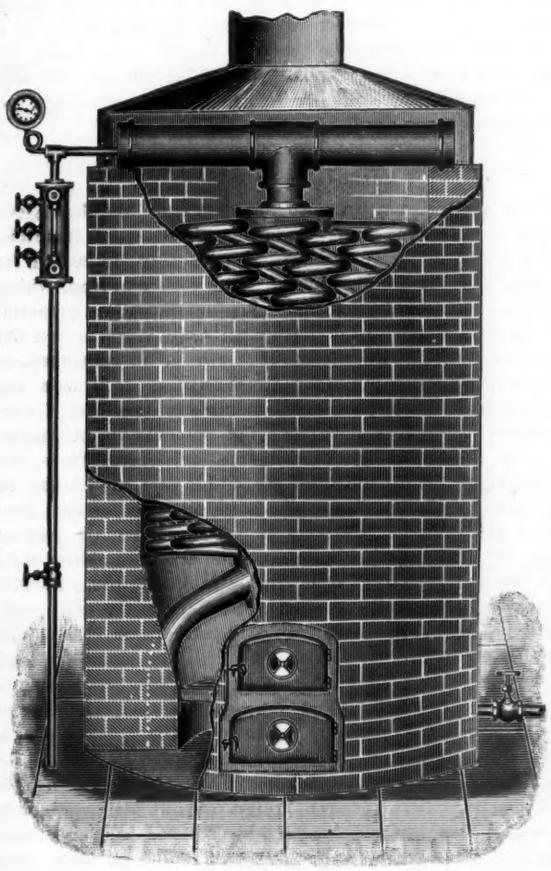


FIG. 1.

lower end of the column is also provided with removable head, these being held in position on the ends of the column by three longitudinal stay-bolts.

The boiler may be made in sections, if desired, and when so constructed a suitable ring is interposed between the ends of the sections for the purpose of protecting the gasket from the heat of the fire, the gasket being used to prevent leakage.

As will be seen the entire boiler is practically within the boiler furnace, the setting forming a combustion chamber throughout its entire height which allows of nearly perfect combustion; and this together with the large amount of heating surface contained in the tubes insures great economy in the use of fuel. The steam dome at top of boiler being placed horizontally and extending from one side of boiler setting to the other is therefore in position to absorb the remaining heat from the gases on their way from the furnace to the chimney after having passed through the network of tubes below, thus forming not only a steam dome but also a superheater, insuring dry steam for the engine or other purposes.

This boiler is designed especially for electric lighting and power plants and for marine service where economy in the use of fuel, high steam pressure and the occupancy of a minimum of floor space are the most important considerations. As the boiler contains a comparatively small amount of water

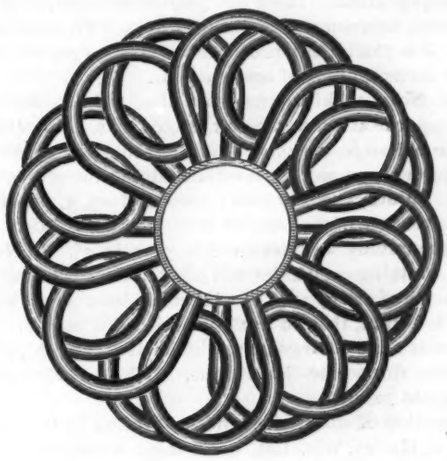


FIG. 2.

it is of less weight than the ordinary vertical boiler, adapting it for use in connection with hoisting and portable engines and for supplying steam for drills and semi-portable pumping machinery. The inventor is H. H. Kelley, of Elyria, O.

The Pace of Recovery.

If half the enterprises, extensions and improvements that are being figured on by the railroad, manufacturing and commercial interests of the United States are undertaken within the next few months there will be abundant employment for capital and manufacturing capacity, sufficient probably, to necessitate a withdrawal of the extremely low quotations for material, machinery and equipment now quoted to induce business. There is a gradual and safe expansion of business. Consumers are slowly adding to their stocks. Investors are looking into new enterprises. Extensions and expansions of mill and shop capacity are being arranged for. How much or how little of this new work will be done no one can safely say. Iron and steel products are weak because as demand improves it is over-reached by heavier production or the threat of it.—[Railway Review.

The "gradual and certain revival of business" referred to by the Philadelphia *Ledger* is well illustrated by a news paragraph conspicuously printed on the editorial page of the Philadelphia *Record* for Oct. 30, which paper takes the same view of the business situation that the *Ledger* does. The *Record* says, with swelling pride that it has found a fact to sustain its theory of a veritable business boom that nobody else has heard of: "Reliable information is to the effect that the New England hardware manufacturers are already doing 60 per cent of the business of normal times. Verily the day of the calamity howler passeth." "Sixty per cent of the business of normal times"—that is, of McKinley tariff times—means 40 per cent *less production* and at least 40 per cent *less wages* than when the McKinley tariff was in force. And this information which the *Record* gives it proclaims with exultation is "reliable." We have no doubt of it.—[Bulletin.

THE rail straighteners at the Edgar Thomson Steel Works struck Nov. 5 because they were notified that they would be expected to drag the rails to the straightening presses. Hitherto men at $1.50 a day have done this work. A committee was appointed to call on Chairman Frick, but thus far no conference has been held and the strikers have been discharged. An effort is being made to put on new men.

LAKE SUPERIOR IRON MINES.

At Duluth, in the case of Mack, Nye & Co., against H. M. Bradley, A. W. Bradley, E. L. Bradley, C. H. Bradley, the Zenith Iron Co. and others, a verdict was given for the plaintiffs for $28,730.50, the amount claimed. The plaintiffs alleged that they had a contract with the defendants to handle the output of the Zenith mine and they advanced money for preliminary work. They claim the defendants failed to fulfil their agreement.

Winston Bros. & Dear of Superior, were the successful bidders for the work of stripping the Mahoning Iron Co.'s mine near Hibbing, Minn. There are 300,000 cubic yards of earth to be moved between now and Aug. 1, 1895. The cost will be $90,000. It is the intention of the owners to get out several hundred thousand tons of ore next year.

Up to Nov. 1 shipments from the Duluth, Mesabi & Northern docks at Duluth were 1,240,000 tons. From the Duluth & Iron Range docks at Two Harbors the total on the same date was 1,300,000. It is estimated that the season's total will be: Duluth, 1,300,000 tons; Two Harbors, 1,400,000 tons.

The percentage of the taxes of Iron Mountain, Mich., to be paid by the mining companies this year is 36. In Norway, Mich., the mining companies will pay 55 per cent of the taxes.

Shipments of ore by way of Escanaba have been heavier, the past fortnight, than in any like period this season.

The Davis mine at Negaunee, which has been shipping to the Weston furnace at Manistique, Mich., has closed down, throwing out 50 men.

At a meeting of stockholders of the Section 33 Iron Mining Co. held at Hurley, Wis., last week, steps were taken to close up its affairs. The leases of mineral lands, heretofore held, have been sold, as has also the machinery and other appliances to the Montreal River Iron Mining Co. This is virtually a consolidation of the two, which are adjoining properties. The Montreal has lately made some extensive improvements, having just put in an air compressor at a cost of $12,000.

There is no foundation for the report that the Chapin mine will be operated in connection with the Hamilton and Ludington. P. L. Kimberly still holds the latter properties and no overtures have been made to the new purchasers of the Chapin.

Active operations have begun at the Adams mine on the Mesabi. A force of 40 men is at work stripping and sinking a shaft. As circumstances warrant, the crew will be increased until it reaches 200 men.

At the South Winthrop the pumps are still lifting water and will be moving for some time yet before the shafts are emptied. At the old open pit on the north side they have put the steam shovel at work stripping the low grade ore. There are about 8,000 yards to be shifted this fall and winter. The stripping is from 12 to 20 feet thick, and is mostly sand. The two feet covering the ore is hardpan. There is a large amount of this ore, enough to require several years to exhaust.—[Iron Ore, Ishpeming, Mich.

THE "BEAR" MOVEMENT IN BILLETS.

Wheeling district steel mills have been sufferers recently from the bear manipulations of the brokers. It is not a new thing in iron and steel markets that low quotations are given wing, and low offers made on short sales of small quantities, for the purpose of getting the market where a prospective buying interest can cover at a figure more to its liking. Bessemer pig iron producers have had some little experience in this direction. What certain brokers have been doing with steel, on a smaller scale, has been hinted at in market reports recently. The *Ohio Valley Manufacturer* of November 1 has the following on the authority of steel producers in the Wheeling district:

"These brokers have broadly offered to supply Wheeling steel billets, without naming specific brands, at prices which cut the regular market rates about fifty cents a ton. To be more explicit, offers were made to furnish billets of any one of three brands, Wheeling steel at the offerer's option, at certain prices, enough below the ruling rates, to be a tempting bait to buyers. Certainly it is none of the writer's business, or in fact anybody's business, at what price any of the steel mills offer to sell, or do sell their product, but when brokers go into the open market in person or by circulars, and without authority offer any one of three brands of steel at cut rates, it is a serious matter and everybody's business, who is interested directly or indirectly in the business of producing and selling steel. It is serious and technically not square to make such an offer, when no particular brands are specified, because the offer is sufficiently comprehensive, under the wording alluded to, to include any brand in the Wheeling district, especially when there are only four of them. For instance, such an offer inferentially includes Riverside steel, and the writer feels warranted to make the assertion in fact to insist, that no broker can furnish Riverside steel at any price, and that no broker has authority to offer it for sale. The writer is also warranted in claiming that no broker is authorized to offer the Wheeling Steel & Iron Co. brand of steel, at prices which cut the ruling rates.

"And this is not all: the Bellaire Steel Co., assert distinctly that no broker anywhere has authority to offer the Bellaire brand at cut rates; and so likewise does the Junction Co. repudiate the existence of such authority. Were these brokers bluffing, or did they exceed their authority, with the purpose of buncoing some of the Wheeling district steel makers? * *

"There is another view to take of this mispractice, which does not relieve it of distinct offensiveness, or mitigate the censurableness of such resorts to illegitimate competition. The markets have not been strong, so far as prices are concerned, and the outlook is so dependent on a contingency that no one can tell whether to cultivate confidence or to despond; and under such conditions and circumstances, real friends, operators who are manly enough, and who are sufficiently interested in the business to promote its well being in a sterling way, will forget for the time that a dollar made, no matter how or at whose expense, is a dollar gained, and will pass by tricks that could be turned to their advantage, to promote the general interests of the business."

Early Iron Founding.

AT the general meeting of the German Iron Founders Association recently held in Wiesbaden, Dr. L. Beck, of Biebrich, read a paper on the history of iron casting, in which he observed that the first find of metal was a piece of iron, which was discovered in the foundations of an Egyptian pyramid, and must have dated from more than 3,000 years before the Christian era. The knowledge of cast iron, he continued, is comparatively recent: in olden times only wrought iron was obtained from the ore, as indeed it still is in Asia and Africa. However skillful may have been the ancients in producing pig iron, the knowledge of cast iron only dates from the beginning of the fifteenth century, and is first mentioned in the archives of Lille. The practical application of cast iron begins at the period when water power superseded manual labor for blowing the bellows. The art of molding only required the transition from pig iron to cast iron. Besides cannons, cannon balls were cast to replace the old stone projectiles, and their molds were made of gypsum. The casting of iron directly from the blast furnace gradually opened up a wide field of applications. In 1685 the first cast-iron pipes were used for the water service of Versailles, followed by screwed and flanged pipes. In 1708 the Quaker Darby patented the system of box casting, and in the following year started the famous Coalbrookdale Foundry, which in 1780 turned out the first cast-iron bridge. About the same time malleable cast iron was invented in France, and was much advanced by Reaumur, who also perfected the portable shaft furnaces (Schachtofchfen), which must be regarded as the forerunners of the Bessemer converter, and by means of which the casting of iron was emancipated from the blast furnace process. The English cupolas, first mentioned in 1764, were of German origin; and the invention of the steam engine gave fresh impetus to iron casting for the production of dense cast-iron cylinders.

THE strike of the molders at the Walker Mfg. Co.'s foundry, Cleveland, is said by the men to be due to the company's requirement that 10 hours work be done per day and a deduction from day if pouring is completed before the ten hours are up. The company say that the strike came from the introduction of a non-union man and they insist on their right to hire whom they choose. New men are to be put at work.

THE BRITISH DRIFT TOWARD STEEL.

What was pointed out in these columns recently, relative to the rapid increase in the past year, in the use of steel in Great Britain, as shown in the statistics of ingot production, is confirmed in a communication to the London *Colliery Guardian*. It goes into details of changes from iron to steel, from which the following extract will be interesting: "Inquiries recently made in the Midlands reveal a unanimity of opinion in favor of steel among constructive and boiler and machinery engineers and manufacturers engaged in the thousand-and-one miscellaneous trades classed under the generic term of hardwares, who have hitherto been accustomed to use iron of so overpowering a character as to be perfectly remarkable. The situation is one which, to the ironmaker, affords abundant food for reflection. Almost the only industries in which rolled iron seems to be holding its own are those in which a great amount of welding work has to be done; but of this more anon. In the various trades we have specified, and also among the tin plate workers, edge tool firms, cycle makers, cut nail and screw makers and the like, the proportion of steel to iron being used is steadily becoming a constantly diminishing quantity.

"The chief reasons which cause steel to be preferred to iron for stamping and pressing work are its superabundant toughness and absence of fibre, the increased strain which it will bear, and the greatly superior finish which its use renders possible to finished articles. Most users declare that there is less liability to crack in the making of deep stampings of steel, and the homogeneous nature of the material will allow of its being bent and worked, when cold, either way of the grain with much more success and less risk of fracture than is the case with the older material—iron. To tin plate manufacturers steel is a great boon, and it is declared that sheets rolled from steel have a very smooth surface, and thereby less tin is required than when iron was used. Thus a great saving to producers is brought about. A convincing proof of the progress which steel is making is shown in the Black Country, where within the last month large orders have been placed for bridge and other constructive engineering work, and for the greater portion of these steel is a prominent specification. For iron boiler plates the demand now on the Staffordshire iron exchanges is not one-twentieth that of steel, while locomotive tube firms declare that the orders now being received for iron are but a shadow of the past. The increased ductility and ease of working attached to steel over iron is mentioned as one of the great inducements to its requirements. A sure 'sign of the times' is the rapid development which is being made in the steel plate department. Plates can now be rolled in much larger sizes than those of iron, and without, it is well to note, 'extras' being asked. Plates of 20 ft. long by 6 ft. wide, and of 30 ft. long by 4½ ft. wide, and diametrical plates of 11 ft. wide, are now being used in boiler works upon which no 'extras' have had to be paid for rolling. Some of these are of ¾ in. and ⅝ in up to 1 in. and over in thickness, and weigh quite two tons. Galvanized sheets are now beginning to be largely turned out of steel, and one of the most important firms in the Birmingham and Wolverhampton district is now making them entirely of the new metal. They have laid down a signally complete steel rolling plant by which to produce steel sheets instead of iron, and the most gratifying results are anticipated. Economy is secured by the lower price of the raw material as compared with puddled iron, and in the lessened quantity of spelter necessary in the galvanizing process, owing to the harder nature and superior surface of the black sheets. The importance of this particular departure cannot be over-estimated, and must have a most influential bearing upon the future employment of ironworks labor, particularly at the puddling furnaces.

"In some few instances, however, the employment of steel in lieu of iron has not as yet proceeded to any great extent. For example, the makers of heavy chains, chain cables, crane chains, ships' tackle, and of other kinds of naval work find that steel as now produced in the form of bars, plates, rounds, etc., is less reliable as regards its welding properties than iron. This is accounted for by the extreme hardness of steel, and what is termed its 'intractibleness.' Another difficulty which has no tyet been satisfactorily surmounted is the tendency of steel to corrode faster than iron. In view of the strides which scientific metallurgy and chemistry are now making, however, it will be surprising if this defect is not soon remedied. The corrosion frequently takes the form of the 'pitting' of the metal, and subsequent falling into holes—bridge and pier work and similar erections being especially liable to this trouble. Railway companies and other bridgework users also state that bridges which have been erected of steel are not in all cases found to wear equal to iron, while certain boiler users in the Black Country find the same defect in situations where water is likely to accumulate under or on the boiler plates. The remedy which is just now being recommended by some leading steel producers against corrosion is that engineers shall give up specifying, as the chief desideratum in steel, high tensile strain. It is, they assert, in such material that corrosion most rapidly occurs. Mild steel should be preferred, and such metal, it is claimed, can be produced better by the Thomas-Gilchrist method than any other, the basic material being more like puddled iron in its composition than any other steel.

"In face of the facts here referred to showing the growing progress of steel adoption by all classes of manufacturing trades in the Midlands, it is not surprising that increased preparations should be going on in that part of the kingdom to supply the new demand by the establishment of additional steel smelting and steel rolling works and the enlargement of those already existing, and that the puddlers and the manufactured iron masters should begin to regard their occupation as doomed. It is, indeed, in many branches already gone. The future of the iron trade proper is not a happy one, but for steel the outlook is brightening daily."

November Magazines.

In the *Century* for November, Mr. Noah Brooks, war correspondent and a friend of Lincoln, contributes the first of several papers of personal reminiscences of "Washington in Lincoln's Time." An important study of common life from personal investigation is set forth in a paper by Jacob A. Riss on "The Making of Thieves in New York"—a startling revelation of the shortcomings of the New York authorities in the education of the children of the poor. Dr. Washington Gladden contributes a timely article on "The Government of Cities."

"Dora's Defiance" is the complete novel in November *Lippincott's*. Lady Lindsay, the writer, has made her mark in England, though little known as yet in this country. "An Arizona Speculation" by Mary E. Stickney, "In the Bitter Root Mountains," and "Rector Warne's Heresy" are the short stories of the number which has all the variety of contents that is characteristic of *Lippincott's*.

The November number of *Scribner's Magazine* has for its leading article one of especially timely interest on "Election Night in a Newspaper Office," written by Julian Ralph, a newspaper man of wide experience. Col. H. G. Prout's second article on "English Railroad Methods" deals with their organization and management. Of value in illustrating the humorous and pathetic phases of city life among the "other half" are four brief stories or sketches entitled "True Pictures Among the Poor."

JUDGE LACOMBE, of the United States Circuit Court, on Oct. 29th, granted the Magnolia Metal Co. an immediate injunction against the Nassau Smelting Co., of New York City (composed of Benjamin and Moses Lowenstein), restraining them from selling a metal called the "Mongolia" metal, which the plaintiffs alleged they had been assidnously offering in the New York market and elsewhere, claiming it to be the same as Magnolia metal and confusing the trade very generally with the similarity of the names. The Magnolia Metal Co. writes us that it will prosecute anyone to the full extent of the law who infringes in the slightest degree on its patent or trademark rights.

THE United States Heater Co., of Detroit, were obliged to refuse orders for Mascot heaters a few weeks ago on account of the unexpectedly large sale of these boilers and the excessive demand upon their factory. They have now made arrangements for outside foundry accommodations which enable them to fill Mascot orders again without interfering with prompt delivery of Capitol and Hecla Heaters.

COAL HANDLING AT POWER PLANTS.

The Ridgewood pumping station of the Brooklyn Water Works, is located in Brooklyn, N. Y., on Atlantic avenue, between Logan and Chestnut streets, and has a capacity of 110,000,000 gallons in 24 hours. The plant, situated on the north side, consists of one crank engine built by Hubbard & Whittaker, of Brooklyn, and one Davidson compound condensing engine, consisting of four engines running duplex or single, and two double-acting beam engines built by Woodruff & Beach of Hartford, Conn. These latter are especially interesting from the fact that the piston rods are guided by a system of linkage which gives a parallel motion to the piston rod, and used in place of the ordinary guides which are more generally in use at the present day. This part of the equipment has a total capacity of 60,000,000 gallons in 24 hours. On the south side the equipment consists of five Worthington compound high-duty condensing engines with a nominal capacity of 10,000,000 gallons in 24 hours each, making a total for this part of the plant of 50,000,000 gallons.

A boiler plant has been installed, consisting of six boilers of the Bigelow make and four internal-fire, return-flue boilers built by the Edge Moor Iron Co., of Delaware. About 80 tons of coal are burned daily at the south side of the works and 40 tons daily at the north side, making a total daily consumption of 120 tons of coal. This coal is received in bottom dump cars, the track coming into the building at right angles to the line of the boilers, and is loaded into the conveyor which passes below the cars underneath the hopper as shown in Figure 2. It then passes vertically to the monitor of the storage building, where it is carried horizontally and discharged at any part of the building.

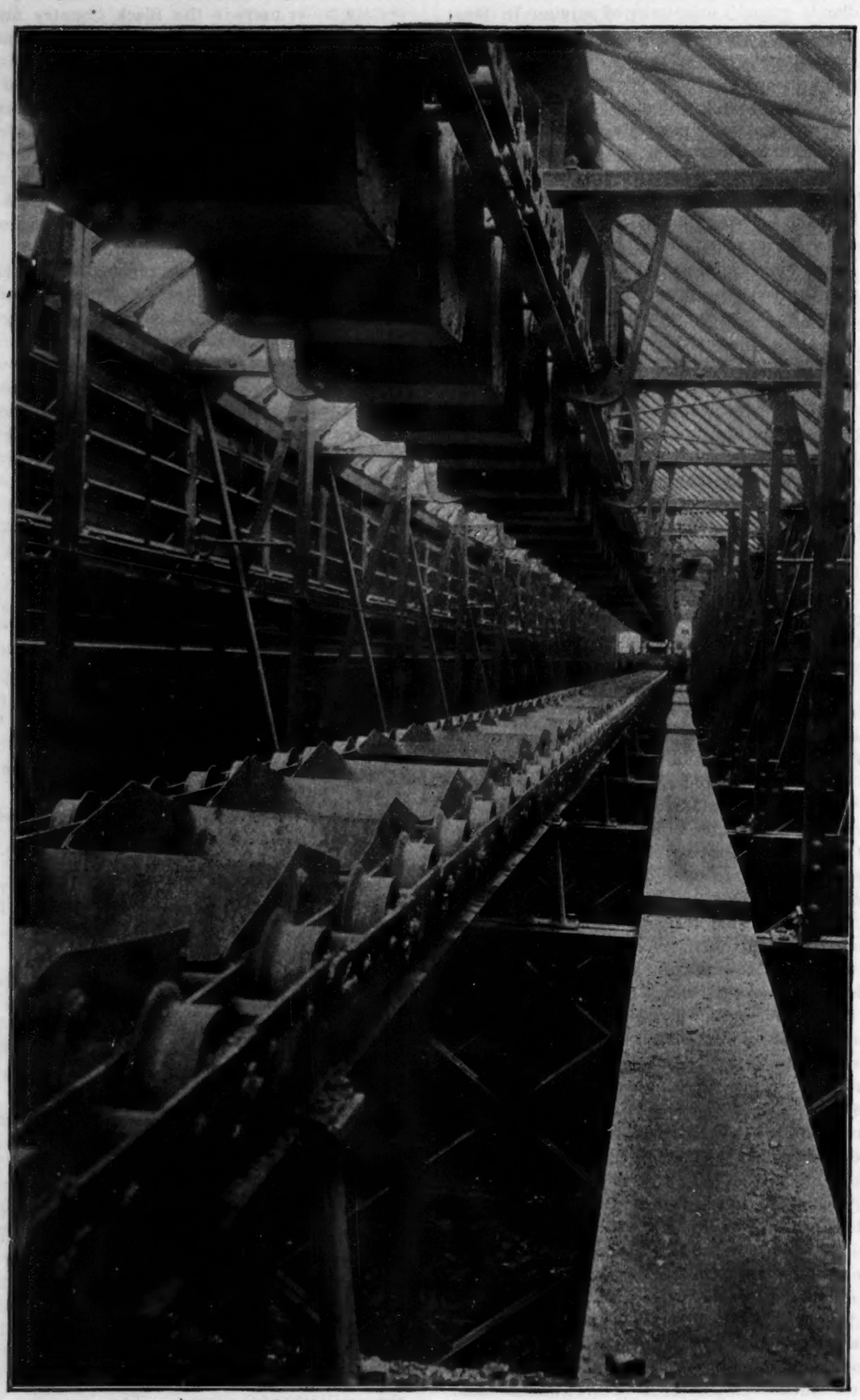


FIG. 1.—COAL CONVEYOR MADE BY THE C. W. HUNT CO., IN USE AT THE RIDGEWOOD PUMPING STATION.

As the upper line of the conveyor is situated in the monitor at a considerable distance from the floor of the storage building, it is intended that as the coal is stored in the building it shall be dumped on the side of the pile, which is nearly as high as the conveyor line, and gradually running down the slope of the coal pile to the floor, so that in falling the breakage of coal may be the least possible.

As the coal is received by railroad it necessarily comes intermittently, and for this reason an especially large conveyor has been installed which has a capacity great enough to unload a 30 ton car in 30 minutes. This conveyor consists of a series of gravity buckets pivoted on a double chain, the whole system being carried on self-lubricating wheels. The buckets shown in Figure 1, are so pivoted on this double chain that the force of gravity keeps them always in an upright position, whether full or empty, and no matter how tortuous the track over which they are drawn.

It will be noticed by referring to Fig. 2 that the direction of the conveyor has been changed, and that it runs in both horizontal and vertical directions. This conveyor chain is driven by a special engine located in the top of the storage building, which engages with the chain by pawls and the whole machine is so designed that the dust can not get into the working parts. It is noiseless in operation and moves slowly, the capacity being obtained by the size of the buckets and not by the speed of the chain.

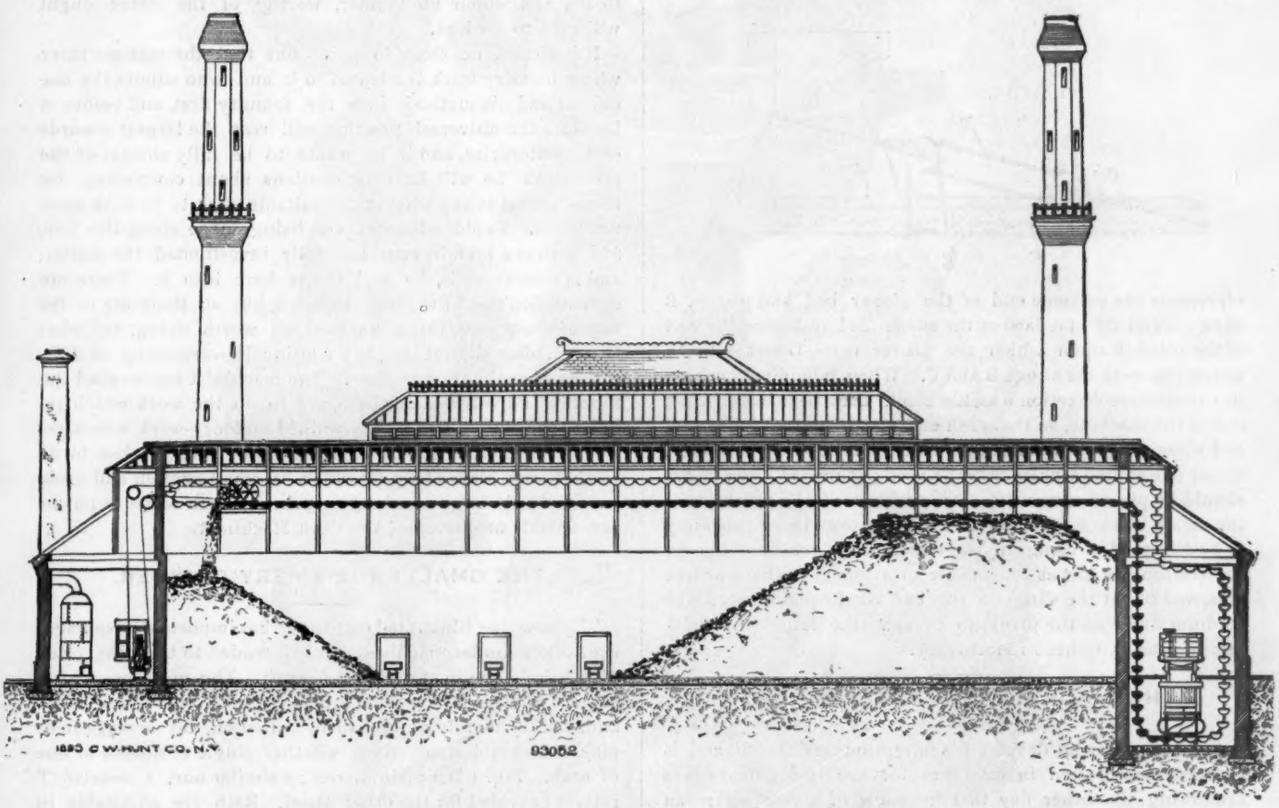


FIG. 2.—SHOWING ARRANGEMENT OF COAL HANDLING MACHINERY AT RIDGEWOOD PUMPING STATION.

The coal is taken from the storage, weighed and delivered to the boiler room by a system of cars and tracks, and scales. The cars are so designed that the fireman shovels directly from them into the furnaces. The floor of this boiler room is very handsome and consists of cast plate pieces, which are corrugated in such a manner that there is little danger of the workman's foot slipping while performing his daily duties.

The equipment of coal handling machinery was designed and furnished by the C. W. Hunt Co., engineers, of New York.

Empire Paint & Roofing Co. Specialties.

In their recent publications, the Empire Paint & Roofing Co., of Philadelphia, direct attention to their litho-carbon black and red paint. In iron and steel and manufactures thereof, its uses are conspicuous among founders, rolling mills, structural works, bridge works and boiler shops. For smoke stacks, boiler fronts, bridges, tanks, and all building material it is especially recommended by the manufacturers. As a covering for cold air pipes, for the inside of vats and tubs, for wires, dynamos, etc., it has also been employed with good results. Its spreading capacity is emphasized, one coat answering in situations in which two coats ordinarily would be employed. It retains its gloss, and is not affected by heat or cold. It is water-proof, acid-proof, and resists a temperature of 500 to 600 degrees. Its adaptation to the preservation of wood exposed to dampness or heat has been well demonstrated. Special tests have shown its long life as a covering for iron, tin and other metals exposed to the weather, and for iron and wooden bridges and railroad equipment. Owners of iron and wooden vessels have been large buyers of this paint for preserving vessels bottoms as well as smoke stacks.

The same firm manufactures a gutta-percha roofing, with wire edge lock joint and has introduced it in a large number of plants, including foundries, iron works, steel mills, railroad shops, etc. Many large buyers are included among its regular customers. A 32-page catalogue and prices will be sent on application to the Empire Paint & Roofing Co., 111 N. 4th st., Philadelphia.

The Garrett Rod Mill.

A letter which we have recently received from Mr. William Garrett, of Joliet, Ill., gives us the following information concerning the work of the rod mill of which Mr. Garrett is the inventor. The largest single turn (10 to 11 hours) on a Garrett rod mill is 390,640 pounds, or 174 gross tons. The largest double turn (22 hours) on a Garrett rod mill is 742,000 pounds, or 331 gross tons. The largest week (11 single turns) on a Garrett rod mill is 1,640 gross tons. The largest month on a Garrett rod mill is 6,340 gross tons.

There are four Garrett mills in this country which have each produced over 6,000 gross tons of rods in a month, and honors are divided among them. Some have the largest turn on No. 5 rods; others the largest turn on No. 4. The largest single turn referred to above was made when rolling No. 4 rods. Over 156 gross tons of No. 5 rods have been rolled on a single turn. There are 13 Garrett rod mills in this country capable of producing from 65,000 to 70,000 tons of wire rods in a year.—[The Bulletin.

THE production of pig iron in Germany this year will considerably exceed 5,000,000 gross tons, a much larger annual production than Germany has ever achieved.

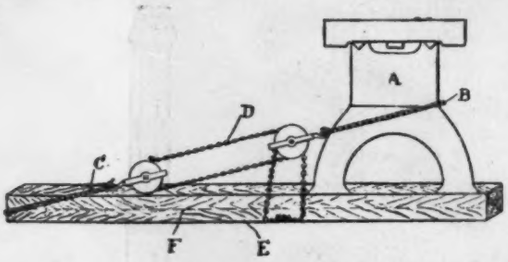
MACHINE SHOP AND FOUNDRY.

MOVING HEAVY MACHINERY.

The transportation or moving of heavy machinery to their places on the foundations is often a matter of some difficulty. Skids and rollers are always utilized when they are available but as a general thing they can only be used for moving the machinery in one direction, and resort must be had to blocking and levers for moving the machinery in a lateral or transverse direction onto the foundation, which is not only a slow and tedious process, but also expensive.

The method of moving heavy machinery shown in the illustration has proved very successful in our own practice, and we can recommend it for moving heavy machinery very quickly in any direction.

The plan consists in placing a plank or beam of wood under the feet or frame of the machine facing the direction the machine has to be moved, and then attaching a sling around the machine and another sling over the extreme end of the plank or beam, and then connecting the two slings by means of a tackle block, as shown at B C D in the engraving, where A



represents the extreme end of the planer bed and platen, B sling around the standard of the same, C sling across the end of the plank E upon which the planer rests, D tackle block which connects the slings B and C. When moving a machine in a transverse direction a tackle block may be used on each end of the machine, so that each end may be moved in unison, and when moving the machine in the direction of its length, either one or two tackles may be used; if one is used, a bar should be placed across the extreme ends of the planks, and the tackle block hooked on to that. The only thing necessary to be observed in using this appliance is to get the sling on the machine as low as compatible with safety to the machine legs, and to get the sling on the end of the plank below the medium line F of the plank, to prevent the latter from raising.—[John T. Usher in Machinery.

THE MACHINIST IN THE FOUNDRY.

An engineer who devotes his attention mainly to and is especially interested in machines for use in foundries was remarking the other day that he knew of a case where an establishment making large numbers of steam-pipe elbows had built a special machine at a cost of about $4,000 for tapping these elbows, the saving effected by the machine as compared with their older methods being only a few cents on the hundred elbows; yet it was all they expected, and was enough to warrant the expense of the machine.

The manager of the same establishment was shown, conclusively, that by the adoption of a certain molding machine for making these same elbows the cost of their production could be reduced, as compared with his present methods, considerably more than 50 per cent. The machine was not ordered, and our friend looks upon this as a typical illustration of the peculiar difficulties which lie in the path of the man who attempts to do missionary work in the foundry. Here was a concern willing to make close figures on the possible saving by the use of a machine to be set up and used in their machine shop, and to be guided by the results shown by the figures even though the margin was very small; yet when the same concern came to consider a machine of much greater economic potentiality for their foundry, figures showing a very large margin failed to impress them sufficiently to influence their decision in favor of the machine.

This and many other similar instances are probably due, mainly to the fact that successful manufacturers have been educated up to the point of taking every possible advantage and introducing every possible improvement in machine shop and kindred operations, while in the foundry they have so long been accustomed to letting things go in the old way that the mere introduction and use of an improved machine or method that, were it in the machine shop, would be taken as a matter of course, is here looked upon as revolutionary, and, in fact, so much of a departure from the beaten path as to make it seem like a leap in the dark.

No doubt the fact that improved machines which are to be used in machine shops will be under the care of, if not operated by machinists, skilled in such matters and interested in their success, while in the foundry it is usually different, undoubtedly has much to do with the matter, and in many instances this feature of the case is of considerable importance.

Nevertheless, nothing seems more certain than that foundry work is to be greatly improved within the next few years, and in no way more than by the increased use of machinery for doing that large proportion of work which is scarcely more than a repetition of the same cycles of movements and operations from morning until night, and from Monday until Saturday—work which any intelligent man can quickly learn to do, and which no molder, worthy of the name ought willingly to work at.

It is almost needless to point out that the manufacturer whose foundry work is adapted to it and who admits the machinist and his methods into the foundry first, and before it becomes the universal practice, will reap the largest rewards of his enterprise, and if he wants to be fully abreast of the procession he will be very cautious about concluding for himself what is and what is not suitable work to be done upon machines. Rapid advances are being made along this line, and unless a foundryman has fully investigated the matter, and is sure about it, he had better look into it. There are some difficulties in the way, perhaps, but so there are in the way of about everything that is at all worth doing, and what is work, after all, but simply a continual overcoming of difficulties of one sort or another. The machinist has invaded the foundry and will remain there, not to do the work which requires the skilled and highly-trained molder—work which requires the exercise of the real art of the molder—but to do all that large class of work which is small enough and made in sufficiently large numbers to make it worth while to put in and operate machines.—[American Machinist.

THE CHALLENGE EMERY GRINDER.

The machine illustrated on page 15 has important advantages over other similar machines. It is intended to take the place of a grindstone in any class of work. The machines represented in Figs. 1, 2, 3 and 4 are made both rights and lefts; and, as they merely require to be bolted on, any arrangement may be had and at any time, whether single or double or one of each. Fig. 1 is a plain L rest; a similar one, a beveled T rest, is provided for the other wheel. Both are adjustable in all directions, and for any thickness of wheel. Fig. 2 shows a noteworthy feature; it is a "dry wheel guard" attachment for catching the grindings, and for preventing the inhaling of dust and grit, and injury in case of accident. Fig. 3 is a surface attachment for grinding flats—a rapid and popular method. Fig. 4 is a "wet wheel guard" attachment for tool grinding; water preventing the drawing of the temper. The machine is operated easily and it is impossible for it to get out of order. It has long self-aligning, detachable, capped, dust-proof, babbetted boxes, to which the makers direct particular attention. It has also a two-step pulley for change to faster speed when the wheel is worn. The machine is sold by the Manufacturers' Tool Supply Co., 17 South Canal st. Chicago, who will send further description and particulars upon application.

SHOP AND FOUNDRY NOTES.

Both chilling and case hardening refer to imparting to cast and wrought iron respectively a high degree of surface hardness, and on this account they are not infrequently confounded with each other, although the modes of operation in the

two processes are substantially different. For example, chilling, or chill-casting, may be defined as a process of giving great superficial hardness to cast iron by pouring it, in casting, into molds of iron. By this artifice the metal adjacent to the metal of the mold is so rapidly cooled that the carbon contained therein is retained in the combined state, thus imparting the desired hardening to the exterior of the casting. The depth to which the chilling may penetrate may vary, according to circumstances, from a little more than skin-deep to an inch or more. Case-hardening, on the other hand, is a term properly applied to a method of surface hardening wrought iron by converting the exterior into steel. This is effected by surrounding the wrought iron with carbon, or carbonaceous substances, and subjecting it to heat. By this means the metal is converted superficially into steel, by which the desired hardness is imparted to it.—[Manufacturer and Builder.

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James F. Hobart, the well known mechanical writer, makes some valuable suggestions relative to hand lathe work: "By 'hand lathe work' I do not mean tooling of work in a speed lathe with hand tools, but I do mean the making in ordinary lathes, by hand manipulation, such things as studs, set screws, finished hexagonal nuts and a multitude of small metal parts. For example, take a steel nut (hexagonal of course), the sides left as delivered from the hot press, the top to be finished. To put these nuts one by one through the nut-tapper, and then screw them upon a short screw arbor mounted in a lathe chuck, takes much time, especially as all the turning off has to be done after the work is thus mounted. Then the nut must be finished up a little with a hand tool, smoothed with emery cloth, and perhaps polished. All this, as the Chinaman said, 'takes too much long enough.' The way to do such work is to use a turret lathe with a hollow spindle. Put on a chuck which will just take the nut, and which will allow it to be squeezed therein tight enough to hold it there during the milling operations. A rod inside the hollow spindle will drive the nut out of the chuck after it has been milled. The first tool in the turret is a square-end concern used for pressing the nut firmly into the chuck after it has been loosely placed therein by the fingers, while the lathe is running, if necessary, but usually it is not, as the lathe must be stopped and reversed to back out the tap, and then, when it is stopped again, the nut can be removed and another slipped into the chuck."

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The third annual meeting of the Foundrymen's Association was appointed for Wednesday evening, Nov. 7, at the Manufacturers' Club, Philadelphia. Addresses by President Schumann, P. D. Wanner and others were scheduled, on the "Value of This Organization to Foundrymen." Reports were asked for from the membership as to the present condition of the foundry trade and the outlook for the immediate future.

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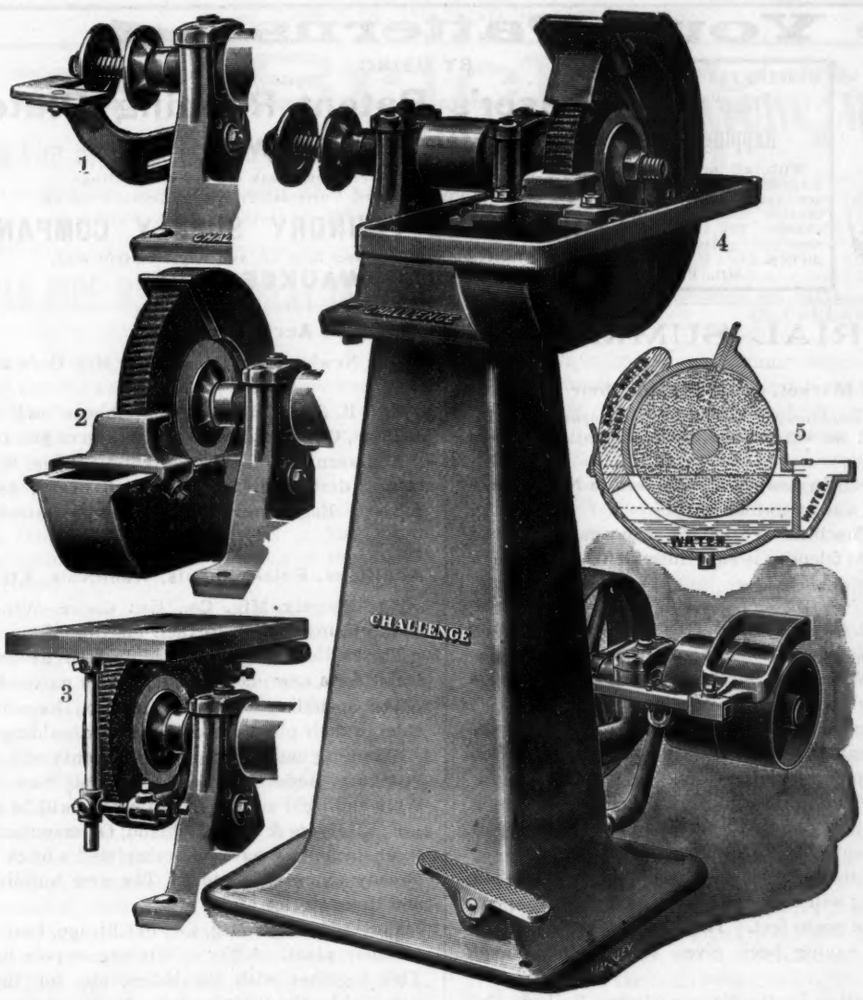
The importance of repair work in dull times is appreciated by every machine shop proprietor. That it is worth cultivating at all times is emphasized in this paragraph from *Machinery*: "Don't let a repair job go away from the shop because you can't do it, for the man who can do it will get all the work next time. The repair shop that gets the reputation of doing any job that comes along gets all the good jobs, which make up for an occasional 'hard' one, that is unprofitable."



THE CHALLENGE EMERY GRINDER.

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A stenographer's error is responsible for a misquotation in the account of the Western Foundrymen's Association meeting, in our last issue. Mr. O. T. Stantial's reference to Mr. West's statement is thus reported as part of the discussion: "He (Mr. West) says that a ½" bar would show better in stove plate iron than in a harder iron." Mr. Stantial's remark was a correct reproduction of Mr. West's statement in his paper, or just the opposite of the above.

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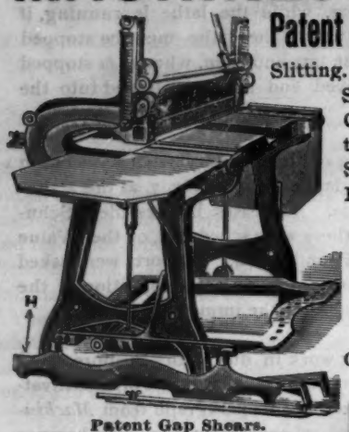
A cubic inch of cast iron weighs .26 of a pound, but for making estimates is usually called .25. By dividing the number of cubic inches by four we have the weight in pounds.

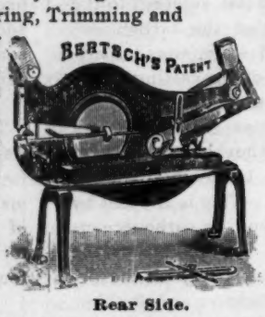
MACHINES FOR WORKING SHEET METAL



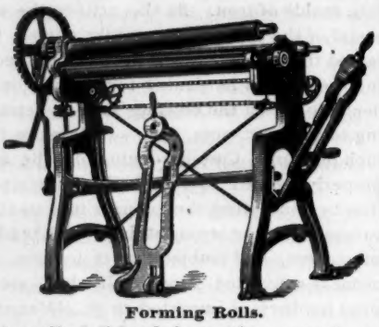
Patent Gap Shears.

Patent Gap Shears, Especially designed for Squaring, Trimming and Slitting. 6 to 18 inch throat for Slitting Wide Sheets. Complete for Tin or Iron to 14 gauge. Seven Styles of various lengths HAND AND POWER

General Purpose Punch and Shear. Seven Sizes.



Rear Side.



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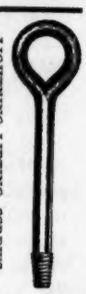

INDUSTRIAL SUMMARY.

New Buyers in the Market, and Some of Their Wants:—

[If you are in need of machinery of any description, please notify *The Iron Trade Review* and we will put you in communication with our advertisers at once.]

Faucette & May, Burlington, N. C., will want a No. 2 Merriman bolt cutter and a 16 or 18-inch shaper.

The Enterprise Machine Works has been established at Richmond, Va. B. A. Glenner is superintendent.

New Construction:—

The Falcon Iron & Nail Co., Niles, O., is erecting a pickling and wash house at its new tin plate plant.

The W. Dewees Wood Co., McKeesport, Pa., is erecting a new iron building to take the place of a wooden one.

Randolph & Cowles, of Waterbury, Conn., have placed the contract for the extension to their muffle room with the Berlin Iron Bridge Co., of East Berlin, Conn.

The Baltimore & Ohio has begun work on new car shops at Zanesville, O. The new plant will be used for general repair work, with capacity sufficient to employ 200 men.

For the new tin plate plant now going up at New Lisbon, O., the main building will be 100x200 feet, boiler house 45x60 feet, annealing house 70x80 feet. These are all to be built of iron, the contract having been given to the Youngstown Bridge Co.

The new power station for the Nassua Electric Railway Co., at Brooklyn, N. Y., will be 102 ft. wide and 150 ft. long, and will be constructed entirely of iron and steel, the whole designed and built by the Berlin Iron Bridge Co., of East Berlin, Conn. The roof will be covered with their anti-condensation corrugated iron roof covering.

The Shiffler Bridge Co., Pittsburg, has the contract for a converter building for the Johnson Co., at Lorain, O. The same company will erect an iron building for Zug & Co., Ltd., of the Sable Iron & Nail Works, Pittsburg. It will contain two new sheet mills and a stand of cold rolls, to be driven by a 36x60 McIntosh, Hemphill & Co. engine.

A big street railway power house is now under construction at Glenwood, near Pittsburg, and the cross compound condensing system will be used. Dynamos and engines will be of the largest. The Schultz Iron & Bridge Co., is erecting the building. The Westinghouse Electric & Mfg. Co. has the contract for the electrical machinery, and the engines are being built by the Russell Engine Co.

Fires and Accidents:—

The Newburyport (Mass.) Car Mfg. Co.'s works burned Oct. 31st.

The B. & O. Railroad roundhouse and machine shop at Bellaire, O., burned Nov. 2, with loss of $10,000.

At Davenport, Ia., the Bettendorf Wheel Works were almost totally destroyed by fire Oct. 30. Loss, $40,000; insurance, $18,000. Eagle Iron Works owned the establishment.

Additions, Enlargements, Removals, Etc.:—

The Phœnix Mfg. Co., Eau Claire, Wis., are building an addition, 160x46 feet, to their machine shop.

The Ludlow Mfg. Co. have broken ground at Springfield, Mass., for a new machine shop, to be 100x60 feet in size.

The Spaulding Machine Screw Co., Kensington, N. Y., will enlarge their plant, making the new building 100x120 feet.

Stamping and finishing departments will be added to the Pittsburg Reduction Co.'s plant at New Kensington, Pa. Ware and light articles of aluminum will be manufactured.

F. E. Myers & Bro., Ashland, O., manufacturers of agricultural specialties, have just completed a brick addition to their already extensive factory. The new building is 50x175 feet and three stories high.

The C. T. Segar Mfg. Co., of Chicago, have added a foundry to their plant. A No. 1 Whiting cupola has been erected. This, together with the ladles, etc., for the new shop, was supplied by the Whiting Foundry Equipment Co., Chicago.

Owing to the large increase in the demand for their gas and gasoline engines the Otto Gas Engine Works, Philadelphia, have given out contracts for two additional buildings of brick and iron 75x175 feet, to be used as erecting and machine shops. Besides their stationary, portable and traction engines, they are now getting out a marine engine of from 2 to 250 h. p.

The Middleport Steel & Nail Works of the King, Gilbert & Warner Co., Columbus, O., are to be removed from Middleport, O., to Columbus, where a complete, modern plant will be erected. The plant contemplated consists of a converter house, 85x100 feet, with two converters; a cupola house, 54x33 feet, with three eight feet cupolas; a blooming mill, 161x85 feet; an engine, pump and dynamo house, 50x70 feet; a refractory and crushing house, 40x100 feet; a boiler house, 45x150 feet, with 20 boilers; a gas producer house, 35x65 feet, with five gas producers. In addition to these the company will erect a rolling mill, 100x110 feet. Five of the buildings are to be of iron and the others of brick and iron combined.

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General Industrial Notes:—

The Lima Steel Casting Co., Lima, O., has commenced work at its rebuilt plant with 60 hands.

Poughkeepsie Furnace, at Poughkeepsie, N. Y., practically a new modern stack, was lighted on Oct. 30.

A 20 per cent. reduction in wages—the third cut in a year—has been made at the Lehigh Valley shops near Hazelton, Pa.

The Mahoning Valley Iron Co., Youngstown, O., has put in considerable new machinery for the production of the Daniel Steel Tie Co.'s product.

The Pittsburg Wire Co., of Pittsburg, with works at Rankin, will buy 100 wire nail machines and manufacture nails in addition to rods and wire.

Thirty-four families have gone from Pullman, Ill., to Hiawatha, Kan.. to go into the shops of the Hiawatha Co-operative Car & Mfg. Co., now building there.

The Milwaukee Malleable Iron Co., has been incorporated with a capital stock of $100,000. The incorporators are John Klapinski, Julius Rost and Frank Geister.

The Muncie Iron & Steel Co., of Muncie, Ind., turned out their first hoops on the 10th inst. It is the intention to convert a considerable part of the mill product into hoops.

The continuous mill at the works of Jones & Laughlins, Ltd., of Pittsburg, for rolling billets, merchant bars and shapes, recently turned out 286 tons of 1½ inch billets in twelve hours.

The Glamorgan Pipe & Foundry Co., of Lynchburg, Va., has resumed operations. A fire at the works made it necessary to suspend operations some six months ago, until the burnt structures could be replaced.

A mechanical device has been introduced into the 28-inch mill of the Homestead plant, which places the ingots in the heating furnace and withdraws them. It will lessen the number of skilled men about the furnace.

The W. F. & John Barnes Co., Rockford, Ill., manufacturers of hand, foot and steam power machinery and machine tools find that business has improved in the past month. Orders for drill presses show the largest gain.

The report of the Pottsville Iron & Steel Co.'s receivers shows that on Aug. 24, when the assignment was made the assets were $1,197,730.36, of which $45,972.66 was doubtful accounts, and the liabilities of all kinds, $645,802.84.

An ore concentrator plant has just been erected by Sanders & Thomson, of Philadelphia, at the Sheridan furnaces near Lebanon, Pa., for the purpose of concentrating Cornwall ores. Good results have already been obtained. The firm has succeeded in turning out 62 per cent of ore from material that ran less than 40 per cent, thus reducing the sulphur to a lower percentage than is accomplished by the roasting kilns.

The new car wheel works which have been building at Raleigh, N. C., for several months, have been completed and put in operation. The works have a capacity of 50 wheels a day. The company have a capital stock of $100,000, and the Lobdell car Wheel Co., of Wilmingtan, Del., are said to be largely interested in them.

The charcoal furnace to be built at Ogden, Utah, will be 55x11 feet with a 6-foot vertical blowing engine and iron stoves. The pipe foundry will make from 30 to 40 tons of gas and water pipe daily. A general foundry and machine shop will also be built. Negotiations are pending for a small rolling mill and a stove foundry.

The shipments of rails, bridge and electric railway works from the Pennsylvania Steel Works during October were the largest of the year. Large contracts for rails for Main railroads and the Philadelphia and Baltimore traction companies were filled. The company has also built bridges for Philadelphia and Washington. October's output of rails was 27,000 tons, the largest month's tonnage in four years. On November 3, $73,000 was paid out in wages to about 3,700 men.

In its record of carbuilding, the *Railroad Gazette* notes that the Terre Haute Car Mfg. Co. is running with about 50 per cent. of its usual force and is building 150 cars for the Vandalia; that the Ohio Falls Car Mfg. Co., has all departments in operation, employing about two-thirds its usual force; that the Mt. Vernon Car Works, Mt. Vernon, Ill., is repairing 500 freight cars; that the Wagner Palace Car Works, at East Buffalo, N. Y., is working full time with 400 men.

Argument was made at Milwaukee Nov. 2 on the motion of the Central Trust Co., of New York, to be made a defendant in the suit of the Northwestern Iron Co., of Milwaukee, against the West Superior Iron & Steel Co. The last named company has a capital stock of $2,500,000, and has been making steel plates for the whaleback steamers. Its receiver has accumulated $80,000, which the Central Trust Co. now demands under a $3,000,000 trust mortgage, also claiming the right to foreclose upon the property.

W. F. Sauber, engineer of the "W. H. Gratwick No. 2" writes as follows to the Buffalo Forge Co., under date of Oct. 18, 1894: "The forced draught you put in the steamer 'Wm. H. Gratwick, No. 2' is a complete success. We have not been able to get the slack coal and have mostly burned lump, and I find a saving of more than 10 per cent. in better combustion in the forced draught against natural draught. This last trip

we had on one car of slack coal to try it. I worked the engine for 2½ hours, full stroke, and had more steam than I wanted. I feel satisfied with the forced draught. I can burn anything that looks like coal, and have all the steam I wish for.

H. E. Collins & Co., of Pittsburg, sales agents for the Cahall water tube boiler, have sold during the past week 2,000 h. p. boilers to the Carnegie Steel Co., and 450 h. p. to C S. Wallis, of Oregon, for a new tin plate mill. They have just started a 150 h. p. boiler for Zug & Co., Pittsburg; two boilers of 200 h. p. each for Schoenberger, Speer & Co., to use furnace gases; they have just finished erecting one 200 h. p. boiler for the Inland Steel Co., of Chicago Heights. They are also building 525 h. p. waste heat boilers for the St. Louis Stamping Co.'s new plant at Granite City, Ill., and loading for shipment 1,200 h. p. boilers for the Philadelphia Gas Co.'s pumping station at Canonsburg.

Steel Rail Demand for 1895

"The most formidable difficulty in the way of the steel rail trade next year," says a writer in the *Railway Age*, "is likely to be the scarcity of new construction. It is possible that financial conditions may improve so rapidly as to make next year a season of large railway building; but it is not likely. More probably the new track laid in 1895 will not amount to more than from 2,000 to 2,500 miles, using, say, 250,000 tons of steel. On the other hand renewals have been so small, in comparison to what they ought to have been, during the last two summers that there should be an unusual amount of this work next year. But, with the present business outlook, it does not seem as if railways would be able to be much more lavish in their expenditures for repairs next year than they were in 1894. The steel needed for this purpose may be anywhere from 1,000,000 to 1,250,000 tons; that is unless the old rail business should chance to be revolutionized by the inventions of my friend, E. W. McKenna, formerly of C. M. & St. P. and now general superintendent of the Great Northern. As I understand Mr. McKenna's scheme, instead of, as now, cutting off the ends of a wornout rail so as to make it more or less fit for use in second track, he proposes to work the old rail over and turn out a brand new rail, with a loss in weight of a few pounds to the yard, of standard length. If a railway company can be enabled to exchange a given number of miles of wornout 75-pound rails for an equal length of 73-pound rails, all brand new and perhaps somewhat better for the working over, at a cost of some $4 or $5 a ton, as I understand to be expected, it is evident that there are possibilities in it. But, as with every other new invention, however well it promises, we had better wait and see how it performs."

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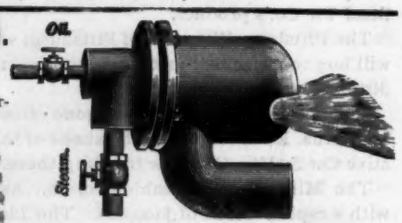

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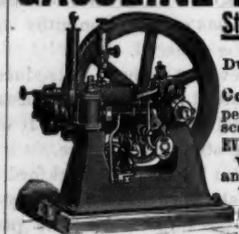

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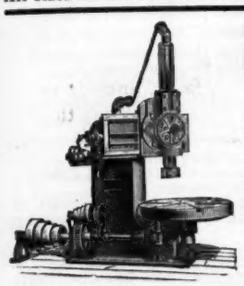

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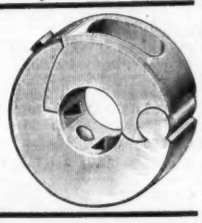

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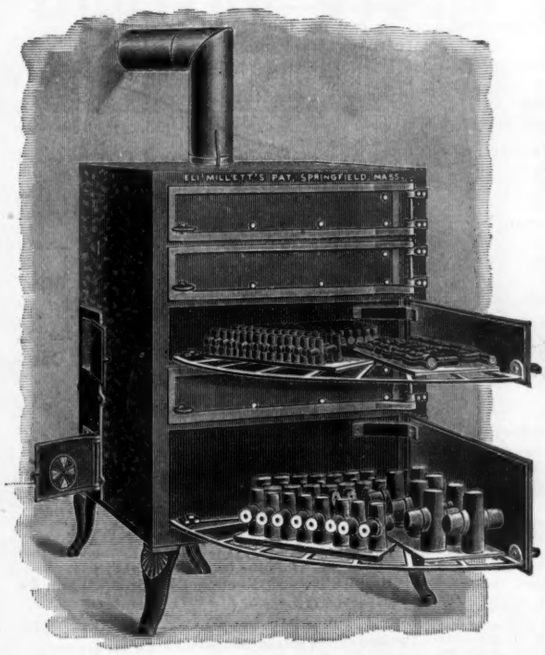

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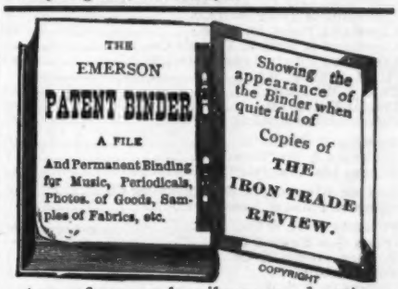

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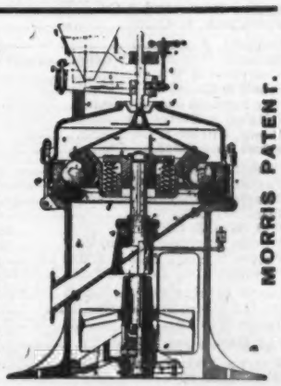

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No. 2 Gray Forge, neutral	9 25@ 00 00
No. 1 American Scotch	11 65@ 00 00
No. 2 American Scotch	10 65@ 00 00
Lake Superior Charcoal	13 00@ 13 50
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No. 1 Foundry	$11 50@$11 75
No. 2 Foundry	10 50@ 10 75
Gray Forge	9 75@ 10 00
White and Mottled	9 00@ 9 25
Warm Blast Charcoal	18 00@ 19 00
Cold Blast Charcoal	22 00@ 26 00
Bessemer	11 00@ 00 00
CHICAGO (reported by our representative:)	
Lake Superior Charcoal	$13 00@$14 50
Local Coke Foundry No. 1	10 25@ 10 50
Local Coke Foundry No. 2	10 00@ 10 25
Local Coke Foundry No. 3	9 50@ 10 00
Local Scotch Foundry No. 1	10 75@ 11 00
Local Scotch Foundry No. 2	10 00@ 10 50
Local Scotch Foundry No. 3	9 50@ 10 00
Southern Coke No. 1	11 00@ 11 25
Southern Coke No. 2	10 25@ 10 50
Southern Coke No. 3	10 00@ 10 25
Southern No. 1 Soft	10 25@ 10 50
Southern No. 2 Soft	10 00@ 10 25
Southern Silveries No. 1	11 50@ 11 75
Southern Silveries No. 2	11 25@ 11 50
Jackson Co. Silveries	15 00@ 16 00
Ohio Silveries No. 1	14 00@ 14 50
Ohio Silveries No. 2	13 00@ 13 50
Ohio Strong Softeners	13 00@ 13 50
Alabama Car Wheel	17 50@ 18 00
Malleable Bessemer	10 50@ 11 25
Coke Bessemer	11 25@ 11 50
CINCINNATI (reported by Rogers, Brown & Co.)	
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Southern Coke No. 2 and No. 1 Soft	9 50@ 9 75
Hanging Rock Coke, No 1	12 00@ 12 50
Hanging Rock Charcoal No. 1, Fdy	16 00@ 17 00
Tennessee Charcoal No 1	14 00@ 14 50
Jackson County Stone Coal No 1	14 50@ 15 00
Southern Coke, Grey Forge	8 50@ 8 75
" " Mottled	8 25@ 8 50
Standard Alabama Car Wheel	15 75@ 16 75
Tennessee " "	15 50@ 16 00
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Jackson Co. Silvery No. 1	15 75@ 16 75
Lake Superior Charcoal	13 50
Tennessee Charcoal	15 50
Southern Soft No. 1	11 75
Southern Soft No. 2	11 50
Alabama Car Wheel	16 00@ 17 50
Hanging Rock Charcoal	18 50
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Southern Coke No. 2 Foundry	9 25@ 9 50
Southern Coke No. 3 Foundry	8 75@ 9 00
Gray Forge	8 50@ 8 75
Southern Charcoal No. 1 Foundry	12 50@ 13 50
Car Wheel	15 00@ 15 50
Spathite	11 25@ 11 75
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Southern Coke No. 2	10 25@ 10 75
Southern Coke No. 3	9 75@ 10 00
Southern Gray Forge	9 50@ 9 75
Southern Charcoal No. 1	14 00@ 14 50
Missouri Charcoal No. 1	12 50@ 13 00
Ohio Softeners	14 00@ 14 50
Lake Superior	15 50@ 16 00
Southern	16 75@ 17 00
Connellsville Coke, St. Louis	4 50

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Old iron rails	$12 50
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No. 1 wrought scrap	8 50
No. 1 Machine cast scrap	8 50
Iron axles	15 50
Axle turnings	8 00
Wrought turnings (free from cast)	6 50
Cast borings	5 50
Uncut wrought iron boilers	4 00
Steel boiler plates	8 00
Grate bars	5 50
Pipes and flues (clean)	7 00
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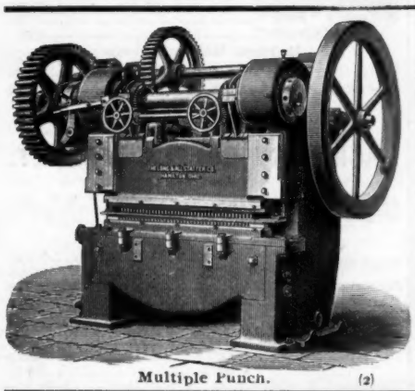

Multiple Punch. (2)

—THE—
Long & Allstatter Co.
HAMILTON, O., U. S. A.
Manufacturers of Belt, Steam and Electrically driven
Power Punches and Shears,
for all kinds of Boiler, Tank and Structural Iron Work, Rolling Mills, Locomotive Shops, Car and Wagon Shops, Plow Shops, etc. Send for catalogue.

A. H. LEITCH, PRES JOHN C. LEITCH, SEC. AND GENL. MAN. JOHN A. WILSON, TREAS.
WESTMORELAND FIRE BRICK CO.
MANUFACTURERS OF HIGH GRADE **FIRE BRICKS.**
PITTSBURG, PA.
Works and Mines, Westmoreland, Pa.

PL DIXON'S PERFECT LUBRICATING GRAPHITE.
The most Marvelous Lubricant Known.
Used Dry, or Mixed with Water, Oil or Grease
NOT AFFECTED BY HEAT, COLD, STEAM OR ACIDS.
An Interesting and Instructive Pamphlet will be sent Free of Charge.
JOS. DIXON CRUCIBLE CO. Jersey City, N. J.

IRON CLAD PAINT CO.
Factory, 75 & 77 Central Way. Sec. & Treas., No. 3 Case Build'g,
CLEVELAND, OHIO.

ORDER DIRECT FROM THE
Iron Clad Paint Co.
And get the genuine article, and save liability of suit for using an article made in violation of the patents issued to Wm. Green, and now owned by this Company.
IRON CLAD PAINT is the most durable, most fire-proof and Cheapest Paint made.
FURNISHED both Dry and Ground in Oil
USED BY NEARLY ALL THE RAILROADS.

Subscribe for the Iron Trade Review, $3 per year.

STRUCTURAL MATERIAL.

Beams and Channels (f. o. b. mill)	1.25c@1.35c
Angles	1.20c@1.25c
Tees	1.35c@1.45c
Universal Plates	1.20c
Sheared Plates	1.30c

MERCHANT IRON AND STEEL.

[List prices out of store.]

Flat Bar.

1½ to 4 by ⅜ to 1 inch	1 30
4½ to 6 by ⅜ to 1 inch	1 35
1½ to 6 by 1⅛ to 2 inch	1 50
1¼ & 1⅜ by ⅜ to ¾ inch	1 35
1 & 1¼ by ⅜ to ¾ inch	1 40
⅝, ¾, ⅞, by ⅜ to ⅝ inch	1 50

Round and Square.

1 to 1⅞ inch	1 30
2 to 2⅝ inch	1 40
2¾ to 3¼ inch	1 55
3⅜ to 4 inch	1 80
4⅛ to 4½ inch	2 40
4¾ to 5 inch	2 60

Oval.

⅜ to 1¼ inch	1 50
⅞ to ¾ inch	1 50
½	1 70
⅝	1 90

Half Oval and Half Round.

1¼ to 3 inch	1 85
⅜ to 1¼ inch	1 65
⅝ to ¾ inch	1 90
½	2 05
⅝	3 15

Heavy Band.

1¼ to 6 by ¼ and 5-16 inch	1 40
1 to 1⅜ by ¼ and 5-16 inch	1 45
⅜ to ⅝ by ¼ and 5-16 inch	1 55
½ to ⅝ by ¼ and 5-16 inch	1 80

Hoop Iron.

1 7-16 to 4, No. 13, 14, 15 and 16	1 85
1 7-16 to 2, No. 17, 18 and 19	1 90
1 7-16 to 2, No. 20	2 00
1 7-16 to 2, No. 21	2 10
1 7-16 to 2, No. 22	2 20
1⅛ to 1⅜, No. 13, 14 and 15	1 90
1⅛ to 1⅜, No. 16, 17 and 18	1 95
1⅛ to 1⅜, No 19 and 20	2 00
1⅛ to 1⅜, No. 21	2 10
1⅛ to 1⅜, No. 22	2 20
15-16 and 1 inch, No. 13, 14 and 15	1 85
15-16 and 1 inch, No. 16, 17 and 18	2 00
15-16 and 1 inch, No. 19 and 20	2 10
15-16 and 1 inch, No. 21	2 20
15-16 and 1 inch, No. 22	2 30
⅞, No. 13, 14 and 15	2 10
⅞, No. 16, 17 and 18	2 20
⅞, No. 19 and 20	2 30
⅞, No. 21	2 40
⅞, No. 22	2 50
13-16, No. 13, 14 and 15	2 20
13-16, No. 16, 17 and 18	2 30
13-16, No. 19 and 20	2 40
13-16, No. 21	2 50
13-16, No. 22	2 60
¾, No. 13, 14 and 15	2 30
¾, No. 16, 17 and 18	2 45
¾, No. 19 and 20	2 55
¾, No. 21	2 65
¾, No. 22	2 75
11-16, No. 13, 14 and 15	2 55
11-16, No. 16, 17 and 18	2 60
11-16, No. 19 and 20	2 70
11-16, No. 21	2 80
11-16, No. 22	2 90
11-16, No. 23	3 00
⅝, No. 13, 14 and 15	2 60
⅝, No. 16, 17 and 18	2 70
⅝, No. 19 and 20	2 80
⅝, No. 21	2 90
⅝, No. 22	3 00
⅝, No. 23	3 10
9-16, No. 13, 14 and 15	2 80
9-16, No. 16, 17 and 18	2 90
9-16, No. and 20	3 00
9-16, No. 21	3 10
9-16, No. 22	3 20
9-16, No. 23	3 30
7-16 and ½ inch, No. 13, 14 and 15	3 00
7-16 and ½ inch, No. 16, 17 and 18	3 10
7-16 and ½ inch, No. 19 and 20	3 20
7-16 and ½ inch, No. 21	3 30
7-16 and ½ inch, No. 22	3 40
7-16 and ½ inch, No. 23	3 50
⅜, No. 13, 14 and 15	3 50
⅜, No. 16, 17 and 18	3 60
⅜, No. 19 and 20	3 70
⅜, No. 21	4 00
⅜, No. 22	4 10
⅜, No. 23	4 25

Light Band.

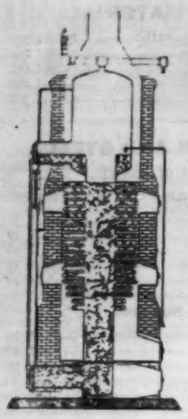
1¼ to 6 by 1/16 to 3-16 inch	1 60
1¼ to 6 by Nos. 11 and 12	1 65
1 to 1⅜ by 1/16 to 3-16 inch	1 65
1 to 1⅜ by Nos. 11 and 12	1 70
⅞ and 13-16 by 1/16 to 3-16 inch	1 80
⅞ and 13-16 by Nos. 11 and 12	1 85
¾ and 11-16 by 1/16 to 3-16 inch	1 90
¾ and 11-16 by Nos. 11 and 12	1 95
⅝ and 9-16 by 1/16 to 3-16 inch	2 05
⅝ and 9-16 by Nos. 11 and 12	2 10
½ by 1/16 to 3-16 inch	2 20
½ by Nos. 11 and 12	2 25

Wagon Box Iron.

⅞ inch, beveled edge, by Nos. 11 and 13	1 80
⅞ inch, " " " " 13 and 14	1 90
¾ inch, " " " " 11 and 12	1 95
¾ inch, " " " " 13 and 14	2 15

Sheet Iron.

No. 10	1 85
No. 12	1 90
No. 14	1 95



THE ADAMS
WATER TUBE BOILER.

This Boiler is absolutely safe from explosion. Gives as much steam from the waste heat as any boiler made. Easy of access for cleaning and repairs. Furnishes perfectly dry steam. Occupies little ground space. Economical in first cost. Send for complete circulars giving list of users and testimonials, one of which is printed below.

The Falcon Tin Plate & Sheet Co., }
NILES, O., Aug. 18, 1893. }

Chas. P. Adams, Esq.

Dear Sir: The three boilers of 225 H. P. each which you furnished us are working in every way satisfactory. We consider them as good steamers as any we have ever used. Up to the present time have spent nothing on them for repairs. Very respectfully,

THE FALCON TIN PLATE & SHEET CO.,
By Warner Arms, Pres't.

C. P. ADAMS.
807 The Cuyahoga, - CLEVELAND. O.

C. W. HUNT COMPANY,
45 Broadway, New York,
MANUFACTURERS OF

Engineers' and Contractors' MACHINERY
For Hoisting and Conveying Purposes.
SECTIONAL TRACK, INDUSTRIAL AND CABLE RAILWAYS.
BARROWS, COAL BUCKETS, WIRE ROPE, TIP CARS, ETC.

Manufacturers' Tool Supply Co.,
DEALERS IN A FULL LINE OF
MACHINISTS' SUPPLIES.
No. 17 South Canal Street, Chicago.
Morse Twist Drills, Kearney & Foot's Files, Wiley & Russell's Lightning Screw Plates, etc, Billings & Spencer's Wrenches, etc.

CLEVELAND ROLLING MILL CO.,
CLEVELAND, - OHIO,
—MANUFACTURERS OF—
BESSEMER AND OPEN-HEARTH STEEL,
Blooms, Billets, and Slabs, Steel Rails, Steel Beams, Channels and Angles. Steel Forgings, Bar Spring, and Sleigh Shoe Steel. Steel Wire of all kinds. Barbed Wire, Iron and Steel Plates, Galvanized and Black Sheet Iron and Steel Corrugated Iron Roofing.

WORLD'S FAIR AWARD.
We are the only Steel Roofing Co. awarded Medal and Diploma for **PATENT CAP ROOFING** at World's Columbian Exposition. We are also large manufacturers of all styles of METAL ROOFING, SIDING, CEILING, ETC. Send for Catalogue and Price List. Mention this paper.

SYKES IRON & STEEL ROOFING CO., - Chicago and Niles, O.

Moffet Portable Drill
UNSURPASSED AS A REAMER.
Weighs 48 pounds and drills from ⅜ to 2 inches diameter.

Runs with Steam or Compressed air.
Will Work in Any Position.
An Economical Substitute for Rachet Drilling.
Send for Circular.

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J. G. TIMOLAT
89 and 91 S. Fifth Ave., NEW YORK.

Bolt and Nut Works.

THE UPSON NUT CO., Manufacturers of Nuts, Washers, Carriage, Machine, Plow and Elevator Bolts, Coach Screws, etc.

Steel Stamps and Stencils.

FLEHARTY, J. H. & Co., Rubber Stampes Seals, Stencils, Automatic Check Punchs, and Numbering Machines. 92 Seneca St.

No. 15-17	2 05
No. 18	2 20
No. 20	2 30
No. 22-24	2 40
No. 25-26	2 50
No. 27	2 60

Steel Boiler Plates—1-4 in. and Heavier.

Tank	1 60
Shell	1 85
Flange	2 10
Marine Flange	2 35
Fire Box	3 35

Above includes plates 90 inches wide.

90 to 96 in. wide	¼c. ℔. extra
96 to 100 in. wide	1 c. "
100 to 104 in. wide	1¼c. "
104 to 106 in. wide	special

American Cast Tool Steel.

ROUND, SQUARE AND OCTAGON.	cts. ℔s.
1 to 2 in, inclusive	08
9-16 to ½ in. "	08½
7-16 to ⅜ and 2⅜ to 3 in.	09
3⅛ to 4 in	09½
⅝ to 11-16 and 4⅛	10
⅝ to 6 in	10½
¼ to 9-32 and 6⅛ to 7 in	11
3-16 in	13

Flats.

	cts. ℔s.
2 to 9-16 in. wide by 2 to ⅛ thick	8

Bessemer and O. H. Steel.

Machinery	base price, 1 80
Tire	" 1 85
Spring	" 2 20
Sleigh Shoe	" 2 20
Toe Calk	" 2 05
Cutter Shoes, tapered and bent	" 2 45

English Tool Steel.

Jessop's	15½c
Hobson's "Best"	15½c
" "Choice"	35c

Burden Boiler Rivets.

½, ⅝, 11-16 and ¾ inches diameter	3 70
Bridge ½, ⅝, 11-16 and ¾ inch diam	3 40

MACHINERY SUPPLY MARKET.

Anvils.

American	℔ 9@10
Wright's	℔ 12

Bellows.

Blacksmiths'	Hill's	dis 40
	Bullock's	dis 50&10
Moulders'		dis 40@40&10
Hand		dis 40&10@50

Belting.

Boston Belting Co.'s standard	dis 70
" " " extra	dis 60&5
" " " best	dis 55
Cleveland Rubber Co. extra standard	dis 60&10
Hoyt's Short Lap	dis 45
Shultz Raw Hide Leather Belting, single,	dis 40
Munson's Short Lap Single Leather	dis 50
Munson's Short Lap Double and Light Double Leather	dis 50&10
Shultz Raw Hide Leather Belting, Double and Light Double	dis 40
Standard, oak tanned	dis 50&10
Alexander Brothers' pure oak tanned	dis 45

Blowers and Exhausters.

B. F. Sturtevant's	dis 20
Boston Blower Co.,	dis 35
Buffalo	dis 40

Chucks.

Cushman's 4 Jaw Independent	dis 45
" Combination	dis 40
" Geared Scroll	dis 30
" 2 Jaw Brass Workers	dis 30
" Drill	dis 35
Wescott's Scroll Combination	dis 33⅓
" Independent	dis 40
" Little Giant Drill	dis 35
Horton's Universal	dis40
" Independent	dis 45
Whiton's Independent	dis 45
National Combination	dis 40
Sweetland "	dis 40
Almond Drill	dis 20
Morse "	dis 15
Skinner's Combination Lathe	dis 40&10
" Independent Lathe	dis 40&10
" Universal Lathe	dis 40&10
" Drill	dis 20

Cutters and Reamers.

Cleveland	dis 10@15
Pratt & Whitney	dis 10@15
Standard	dis 10@15
Morse	dis 15
Brown & Sharpe, Milling Cutters	dis 15
" " Gear Cutters	dis 15

Crowbars.

Cast Steel	℔ 3½
Iron, steel points	℔ lb 3

Drill and Drill Sockets.

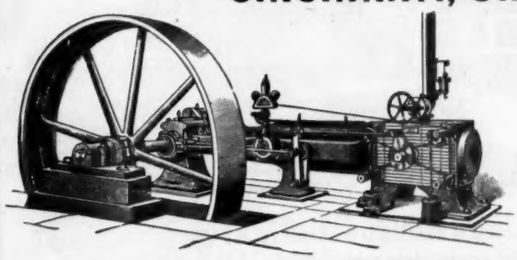
Twist Drills	dis 50&10
Morse Taper and Straight Shank to 1½"	dis 50&10
Morse Taper and Straight Shank Larger than 1½"	dis 25
Drill Sockets	dis 25
Standard Twist Drills	dis 55@55&5
Cleveland " "	dis 55@55&5

Emery.

	No. 4 to No. 54 to 46 gr.	150 gr.	Flour, C. F F. FF.
Kegs, ℔	4½c	5 c	2½c
½ kegs ℔	4¾c	5¼c	2¾c
¼ kegs ℔	5 c	5½c	3 c
10 ℔ cans, 10 in case	6 c	6½c	5 c
10 ℔ cans, less than 10	10 c	10 c	7½c

THE LANE & BODLEY CO.,

CINCINNATI, OHIO.



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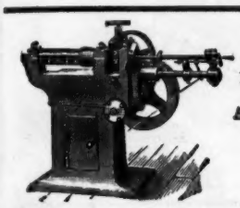
ALL SIZES.

Simple and Compound.

Shafting, Hangers, Pulleys.

Belt Elevators, Saw Mills.

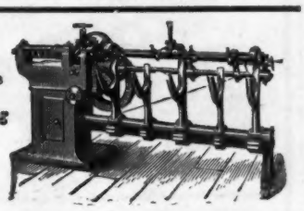


JOHN ADT & SON,

New Haven, Conn.

Builders of Machinery for Hardware Manufacture,

Automatic Wire Straightening and Cutting Machines, Butt Milling Machinery, Butt Drilling Machinery, Riveting Machines, Foot Presses, Screw Cutters, Etc.



THE - CENTURY

IN 1895.

Taking advantage of the general revival of interest in the Great Emperor, THE CENTURY will print during 1895

A NEW LIFE OF

NAPOLEON,

Magnificently Illustrated.

THE CENTURY is famous for its great historical serials, and never in its history has a greater one been projected than this new "Life of Napoleon," written by Prof. Wm. M. Sloane, of Princeton, who has spent many years in preparation for his work. Thus far no biography of "the man of destiny" has appeared in either English or French that is free from rancor and attentive to the laws of historical criticism. THE CENTURY HAS SECURED IT—THE GREAT, ALL-ROUND, COMPLETE AND INTERESTING HISTORY of the life of one of the most marvelous of men. No matter how much you already know of Napoleon, you will want to read this—here is the concentration of all the lives and memoirs. THE ILLUSTRATIONS WILL BE MAGNIFICENT—the wealth of THE CENTURY'S art department will be lavished upon them. Two members of the staff have just returned from Paris, where they have been securing all that is best of Napoleonic material. New portraits will be printed, great historical paintings reproduced, and Castaigne and other modern artists have drawn anew some of the great scenes of Napoleon's life for this history.

In addition to this there will be A NEW NOVEL BY

MARION CRAWFORD.

The title is "CASA BRACCIO," and it is a romance of Italy, full of human passion and exciting episode. A NEW NOVEL BY

Mrs. BURTON HARRISON

will be published during the year. It is called "AN ERRANT WOOING," and is a tale of wandering (and love) among new scenes of travel in Northern Africa and Southern Spain.

Other Features

will be several familiar papers on 'WASHINGTON IN LINCOLN'S TIME," by Noah Brooks, who was on terms of unusual intimacy with the War President: "THE CATHEDRALS OF FRANCE," by Mrs. Schuyler Van Rensselaer, with illustrations by Joseph Pennell. Many more serials will be announced later.

RUDYARD KIPLING

contributes his FIRST AMERICAN STORY to the December number of THE CENTURY.

THE PRICE of THE CENTURY is $4.00 a year. "No home is complete without it." Begin subscriptions with November number. Whatever other magazines you may take, you must have THE CENTURY. All agents and dealers take subscriptions, or remittance may be made directly to

THE CENTURY CO.,

Union Square, NEW YORK.

Send for our beautifully illustrated pamphlet, "The Century Co. and Its Work," and mention where you saw this.

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Iron, Gold and Silver Mining.

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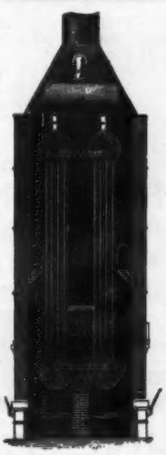

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PATENT VERTICAL

WATER TUBE

BOILER.

SAFE,

ECONOMICAL,

DURABLE.

The best boiler made for the use of gaseous fuel at blast furnaces, puddling and heating furnaces.

Address for particulars

WHEELER BOILER CO.,

Sharon, Pa.

A mechanical engineer, age 40 years, desires to secure a position where his long experience in the management of large enterprises, and in estimating, contracting, purchasing, etc., will be appreciated. References given.

Address **B. M C.,**

Care of The Iron Trade Review,

1141 Monadnock Block, Chicago.

SPEND YOUR OUTING ON THE GREAT LAKES.

Visit picturesque Mackinac Island. It will only cost you about $12.50 from Detroit; $15 from Toledo; $18 from Cleveland, for the round trip, including meals and berths. Avoid the heat and dust by traveling on the D. & C. floating palaces. The attractions of a trip to the Mackinac region are unsurpassed. The island itself is a grand romantic spot, its climate most invigorating. Two new steel passenger steamers have just been built for the upper lake route, costing $300,000 each. They are equipped with every modern convenience, annunciators, bath-rooms, etc., illuminated throughout by electricity, and are guaranteed to be the grandest, largest and safest steamers on fresh water. These steamers favorably compare with the great ocean liners in construction and speed. Four trips per week between Toledo, Detroit, Alpena, Mackinac, St. Ignace, Petoskey, Chicago, "Soo," Marquette and Duluth. Daily between Cleveland and Detroit. Daily between Cleveland and Put-in-Bay. The cabins, parlors and staterooms of these steamers are designed for the complete entertainment of humanity under home conditions; the palatial equipment, the luxury of the appointments, makes traveling on these steamers thoroughly enjoyable. Send for illustrated descriptive pamphlet. Address A. A. SCHANTZ, G. P. & T. A., D. & C. Detroit, Mich.

Emery Cloth and Paper.

Barder, Adamson & Co.	dis 50@50&5
H. H. Barton	dis 50@50&5

Emery Wheels.

Detroit	dis 60@70
Norton's	dis 60@70
Grant	dis 60@70
Sterling	dis 60@70
Celluloid	dis 10&33⅓
Northampton	dis 55
Crystal	dis 65@70
Vitrified	dis 60@70
Vulcanite	dis 60&10
Hamden	dis 60&10@70
Cyclone	dis 60@60&10

Files.

Arcade	dis 60&10@60&10&10
Nicholson	dis 60&10@60&10&10
" X. F.	dis 25
Kearney & Foot	dis 60&10@60&10&10
Black Diamond	dis 60&10@60&10&10
McClellan	dis 60&10@60&10&10
Disston's	dis 65@70
Western	dis 70
Stub's	dis 25
Grobet's	dis 30
Reynolds Bros.' Hand Cut	dis 50
Industry File Works Hand Cut	dis 50

Hammers.

P. S. W	dis 40
Atha new list, Jan. 15, 1887	dis 50
Heavy hammers and sledges under 5 lbs	12c
" " " " over 5 lbs	10c

Jack Screws.

Illinois Bolt Co. list	dis 75

Nuts and Washers.

Size of bolt inches	¼	5-16	⅜	½	⅝	¾	1
Square	8	7	5½	4¼	4	3¾	3⅛
Hexagon	15½	11½	8½	6	5¼	5¼	
Washers	9	8	7	5	4½	4½	4½

In lots less than 100 lbs, ₩ lb add ½c., 1 lb boxes add 1c to list.

Nails (wire).

List July 14, 1887	dis 85
Standard Penny Nails, ₩ keg card rate	
{ Car lots	$1.10
{ Less than car lots	$1.25

Oilers.

Zinc and Tin	dis 60
Brass and Copper	dis 50
Malleable (Hammer's), No. 1, $3.60; No. 2, $4.00; No. 3, $4.40 ₩ doz	dis 10@10&10

Packing, Steam.

Boston Belting Co.	dis 60
American Packing Hemp	₩ lb 9@10
Russia " "	₩ lb 14
Italian " "	₩ lb 13@19
Plumbago Piston	₩ lb 40
Peerless "	₩ lb 60
Morrison's "	₩ lb 45
Square Flax "	₩ lb 50
Sheet Rubber	₩ lb 12&24
Excelsior Rubber	₩ lb 48
Rainbow { Full Rolls	45c ₩ lb
Rainbow { Less than Full Rolls	50c ₩ lb
Eclipse Gasket	₩ lb 75

Picks.

Railroads, 5 to 6 lbs	$12 dis 60
" 6 to 7 lbs	$13 dis 60

Pulleys.

Iron Pulleys, Walker List	dis 50
Medart Pulleys	dis 50
Split Wood Pulleys	dis 55@60

Rivets.

Iron, Thousand, list November 17, 1887	dis 50&10@60
Iron, Ordinary, Cooper's Block and Carriage list November 17, 1887	dis 50&10@60
Copper	dis 50@50&10

Saws.

Disston's Circular	dis 40&10
" Band	dis 25
" Scroll	Net
Hack Saw Stubs	dis 20
" " Eureka	dis 20
" " Star	dis 20
Saw Swages Diston's	dis 30
Atkins' Circular Saws	dis 40&45
" Mill, Mulay and Drag Saws	dis 40&10
" Wood Saws	dis 40&10
" Silver Steel Diamond Cross-cut Saws	70c per ft
" Dexter Cross-cuts	50c "
" Diamond "	30c "
" Tuttle Tooth Cross-cuts	25c "
" One-man Cross-cuts	32c "
No. 1 Handles	23c per pair
No. 6 "	16c "
Excelsior Saw Tools	$6 per doz
Derfection "	$15 "
Petroit Saw Works, Circular	dis 50
" " " Band	dis 25
" " " Mulay	dis 45

Taps.

Cards, Hand and Nut to 2 in	dis 50
Carpenters' " " "	dis 50
Morse " " "	dis 50
Pratt & Whitney " " new list	dis 10
Machine Screw Taps	dis 55
Pipe Taps to 2½ in	dis 70
Stay Bolt Taps	dis 25
Stove Bolt Taps	dis 55
Pulley Taps	dis 40

Vises.

Solid Box	dis 60
Parker's	dis 20@25
Prentiss	dis 20
Stephen's	dis 25@30
Barrett's	dis 30
Miller's Falls	dis 40
Merrill's	dis 15@20
Howard	dis 35

Wire.

New List, Apr. 9, 1894

Brass	dis 40
Copper	dis 40
Bright and annealed, Nos. 0@18	dis 70&10@75
" " Nos. 19@26	dis 75@75& 5
" " Nos. 27@36	dis 75&10& 5
Coppered Nos. 0 to 18, market list	dis 70@70& 5
Galvanized Nos. 0 to 18 " "	dis65& 5
Tinned market Nos. 0 to 18	dis 67½
Cast steel	dis 50
Tinned Broom Wire	dis 70&5@70&10
Annealed Fence, Nos. 8 and 9	dis 75
Annealed Grape, Nos. 10 to 14	dis 75
Stub's Steel Wire regular	.95c ₩ lb dis 30

Wrenches.

Coe's genuine	dis 50
Girard Standard	dis 70&10
Agricultural	dis 75&10
Mechanic's	dis 55&10& 5
Bemis & Call's Combination	dis 35
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Pittsburgh, Bellaire and East	†12.45 pm	† 6.25 pm
Philadelphia and New York	* 1.40 pm	*11.15 am
Baltimore and Washington	* 1.40 pm	*11.15 am
Alliance and Pittsburgh	* 1.40 pm	*11.15 am
Ravenna and Alliance	† 3.25 pm	† 9.50 am
Hudson and Ravenna	* 5.10 pm	* 8.15 am
Philadelphia and New York	*11.10 pm	* 5.25 am
Baltimore and Washington	*11.10 pm	* 5.25 am
Alliance and Pittsburgh	*11.10 pm	* 5.25 am

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FROM CLEVELAND TO	LEAVE	ARRIVE
Xenia and Cincinnati	* 8.40 am	* 5.15 pm
Akron, Columbus & Zanesville	†12.45 am	*11.55 pm
Akron and Columbus	* 8.40 pm	*5.15 pm
Akron and Orrville	† 3.25 pm	† 9.50 am
Columbus and Cincinnati	* 8.00 pm	* 7.00 am

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	Arrive.	Depart.
Akron & Canton	*6:35 P M	*7:10 A M
Akron, Canton & Valley Jctn.	*10:10 A M	*3:15 P M
Valley Jctn. & Way Stations	†6:35 P M	†7:10 A M
Akron, Canton & Chicago	*8:00 A M	*6:30 P M
Wooster and Garrett	†3:00 P M	†11:00 A M
Wooster		*6:30 P M
Akron, Canton & Marietta	†3:00 P M	†11:00 A M
Steubenville, Wheeling, Washington, D. C., and Baltimore	†3:00 P M	†11:00 A M

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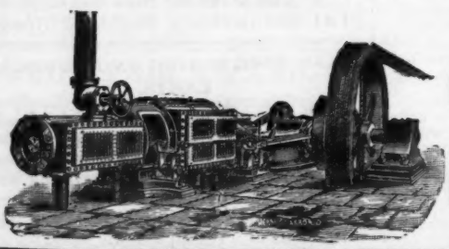

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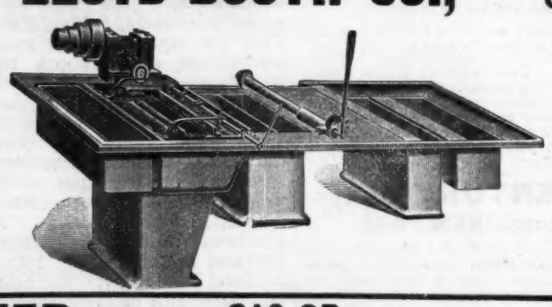

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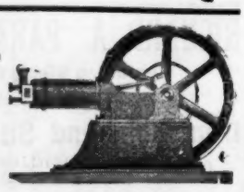

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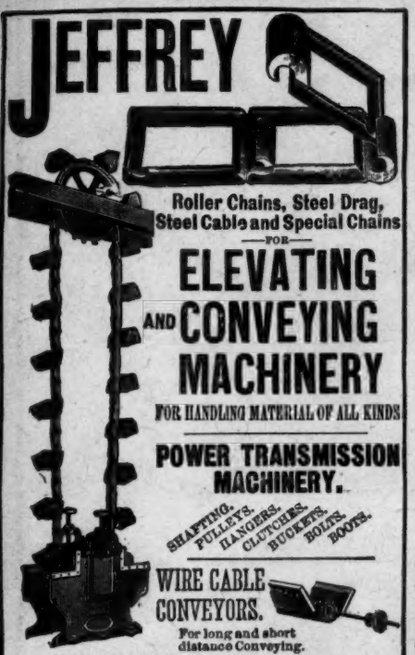

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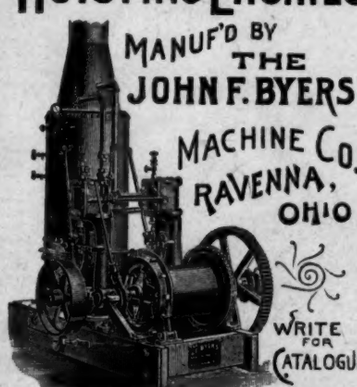

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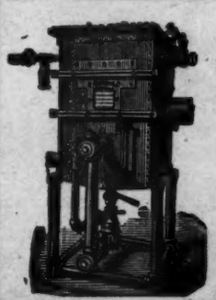

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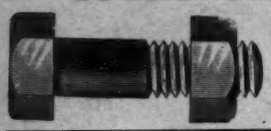

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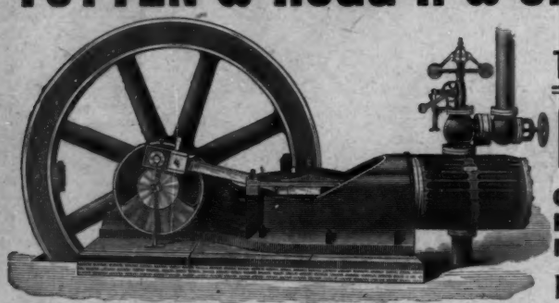

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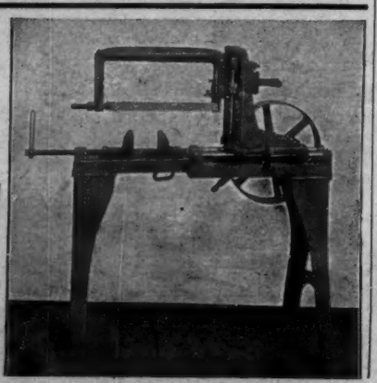

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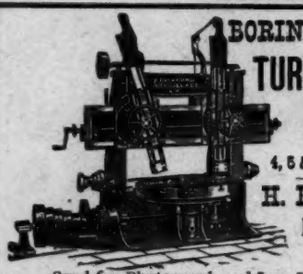

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